

PACIFIC ELECTRIC RIGHT-OF-WAY/WEST SANTA ANA BRANCH CORRIDOR ALTERNATIVES ANALYSIS

Task 3.7 – Purpose and Need Report

Final – July 6, 2011



WEST SANTA ANA BRANCH



SOUTHERN CALIFORNIA



ASSOCIATION of
GOVERNMENTS

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1.0 PURPOSE AND NEED

The Southern California Association of Governments (SCAG), in coordination with the Los Angeles County Metropolitan Transportation Authority (Metro) and the Orange County Transportation Authority (OCTA), has initiated an Alternatives Analysis (AA) for the former Pacific Electric (PE) Railway Corridor known as the Pacific Electric Right-of-Way (PEROW) in Orange County and the West Santa Ana Branch (WSAB) in Los Angeles County. As shown in Figure 1.1, the Corridor Study Area includes the former PE railway ROW that extends approximately 20 miles at a diagonal between the City of Paramount in Los Angeles County and the western portion of the City of Santa Ana in Orange County. The Corridor Study Area is approximately eight miles in width, or four miles on either side of the ROW centerline to two parallel transportation routes – the I-5 Freeway to the north and the I-405 Freeway to the south. While the AA effort focuses on the former ROW, the AA study will evaluate possible connections north from the ROW to Union Station in Downtown Los Angeles, and south from the ROW to the Santa Ana Regional Transportation Center (SARTC). Study efforts will identify and assess a full range of transportation alternatives, and recommend a preferred alternative, or phasing of strategies, that addresses Corridor mobility needs in the year 2035 and beyond, while being sensitive to community and environmental concerns.

The purpose of the Mobility Problem and Purpose and Need Statement is to describe the current and projected future (2035) mobility problems in the Corridor Study Area, and define the overall project purpose and need for a transportation investment strategy by:

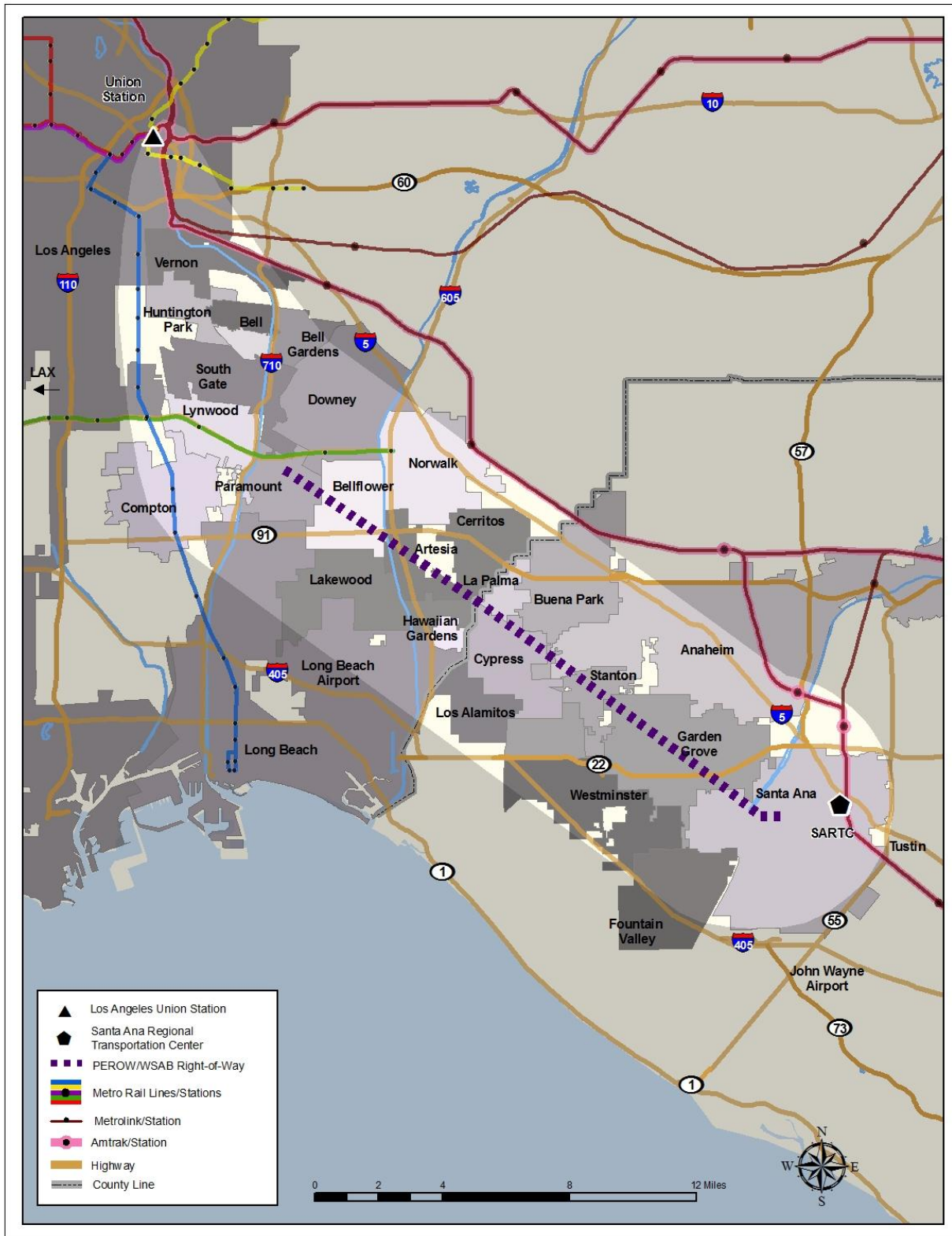
1. Providing a description of the Corridor Study Area, its characteristics, and context;
2. Identifying mobility problems and concerns in the Corridor; and
3. Relating the Corridor mobility problems and concerns to applicable transportation, land use, economic development, environmental, and other goals and objectives to identify an overall purpose and need for transportation improvements.

1.1 Background

The PEROW/WSAB ROW was formerly part of the PE Railway, or Red Car, system that provided transit service to Southern California from 1901 to 1961. At its peak, the PE Railway system connected cities throughout Los Angeles, Orange, Riverside, and San Bernardino counties. The PE service that used this ROW operated south from Downtown Los Angeles, following the alignment currently used by the Metro Blue Line to the Watts Station where passenger service then headed southeast along the ROW to the City of Santa Ana. This PE line provided service to 14 cities, including Lynwood, Bellflower, Artesia, Cypress, Stanton, Garden Grove, West Santa Ana, and Santa Ana. Passenger service to Santa Ana ceased in 1950 and to Bellflower in 1955.

Over time, the western portion of the former PE corridor between the Watts Station and the City of Paramount has been filled in with the I-710 Freeway, the I-105 Freeway and Metro Green Line, the Los Angeles River flood channel, city streets, and residential and commercial development. Now owned by Metro and OCTA, a majority of the ROW east of the I-710 Freeway, and south of the I-105 Freeway, has been unused since 1961.

Figure 1.1 – Corridor Study Area



1.2 Project Purpose

The Corridor Study Area was recommended for study based on a demonstrated need for increased transportation system capacity and travel options as the study area currently has, and is projected to continue to capture, a large share of the region's population and employment growth. Today, the Corridor Study Area is home to more than 4.5 million people with approximately 33 percent of Los Angeles County's population and 42 percent of Orange County's residents living in the study area. From an employment perspective, the Corridor Study Area currently has 2.2 million jobs, or 32 percent of Los Angeles County's jobs and 46 percent of Orange County's employment. In the future, the percentage of each county's employment located in the study area will remain high, but the number of jobs in the Los Angeles County portion is projected to decline due to the continuing loss of manufacturing jobs. Approximately 36 percent of the study area households are identified as low income, and 16 percent are considered transit-dependent (i.e., they have no access to an automobile). With the decline in employment in the northern portion of the corridor, which already has a high percentage of low-income households (45 percent), access to employment opportunities throughout the region will become of increasing importance.

Now and in the future, Corridor travelers have limited choices – automobile or bus transit. Currently, study area freeways and arterials are operating at and beyond capacity, limited transit service is offered, and significant population and employment growth is forecasted for 2035, with a corresponding increase in daily travel. Planned and funded transportation improvements for the Corridor Study Area are primarily highway-based, and analysis of future conditions shows that the planned major highway system improvements will provide little lasting benefit to mobility in the Corridor. Minor investments are planned for the study area's bus transit service, which will result in improved mobility in limited portions of the study area.

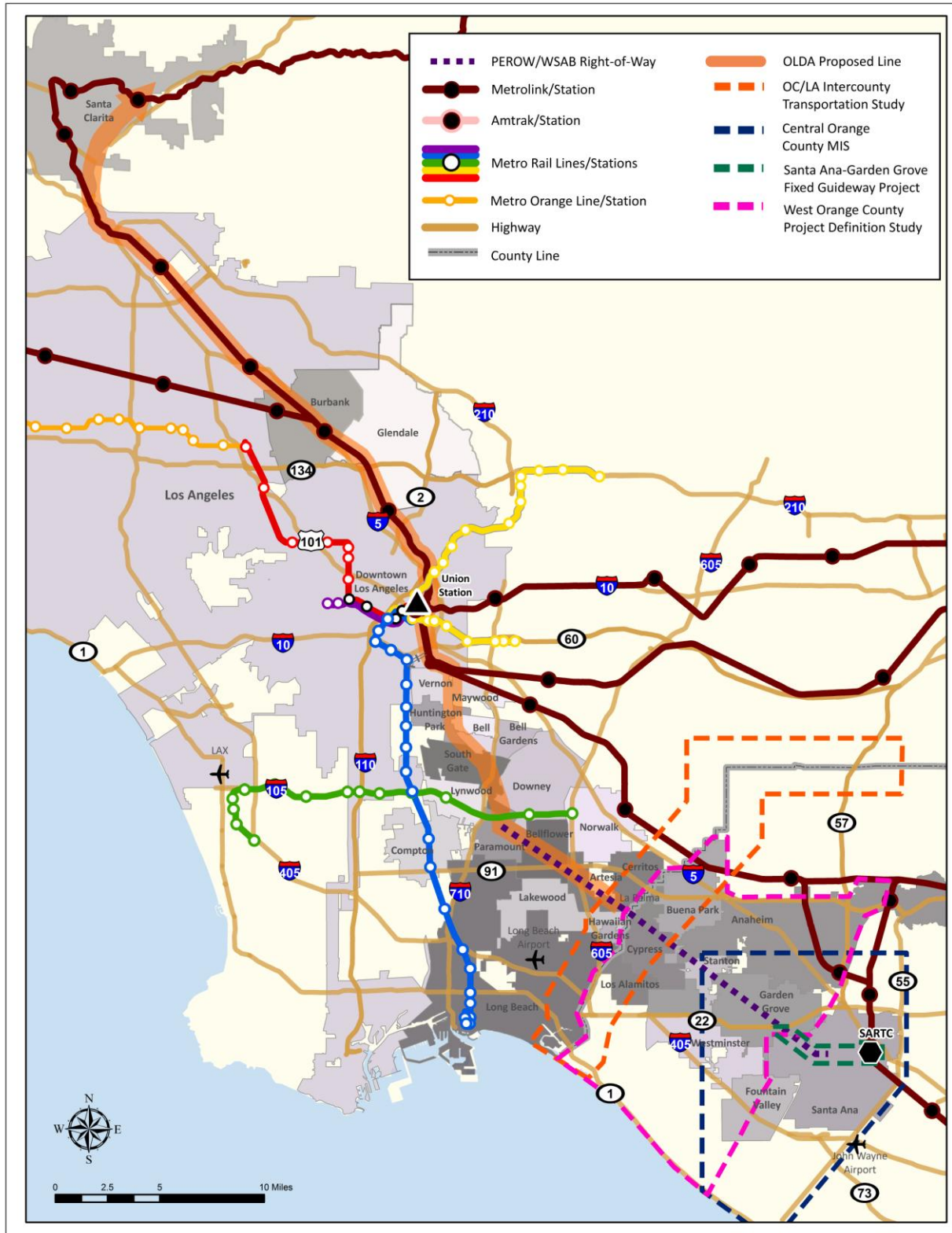
Reuse of the PEROW/WSAB ROW offers the opportunity to implement a high-capacity transit system that could alleviate current and future connectivity and mobility challenges. Fast, high-capacity transit service could provide additional travel capacity, and would create needed connections for residents to a wide range of destinations, while supporting local economic development and revitalization.

1.3 History of Planning Efforts

Starting in 1996, numerous studies have identified the need for improved travel connections between Los Angeles and Orange counties, including the reuse of all or portions of the PEROW/WSAB ROW for transportation purposes again. The studies concluded that transportation between the two counties, and within and to/from the Corridor were constrained, congested, lacking in coordination, and strongly in need of improvements. The most recent studies evaluating reuse of the ROW, illustrated in Figure 1.2, include the following:

- **West Orange County Project Definition Study (2003)** – OCTA conducted this study as a continuation of the *West Orange County Rail Feasibility and Alignment Study* that was initiated to study potential rail systems in western Orange County. The *West Orange County Project Definition Study's* final recommendation was the proposed use of the PEROW by an 11-mile Light Rail Transit (LRT) system, served by a network of Bus Rapid Transit (BRT) lines offering connections from the ROW-running LRT service to West Orange County cities. BRT and LRT service options will be studied in this AA study.

Figure 1.2 – Corridor Study Area Studies



- **OrangeLine High Speed Maglev Project (2005-2006)** – The OrangeLine Development Authority (OLDA), a joint powers agency, was formed to pursue development of a high speed transit system in Southern California. A series of ten milestone reports was prepared for OLDA documenting Phase 1 Preliminary Engineering efforts for a proposed high speed magnetic levitation (maglev) project. The proposed 110-mile system was designed to operate south from the City of Palmdale in northern Los Angeles County through Santa Clarita, Burbank, and Glendale to Union Station in Downtown Los Angeles, south through Vernon, Huntington Park, and South Gate, and along the PEROW/WSAB ROW to Santa Ana in Orange County. Maglev service will be evaluated as an alternative in this AA study.
- **Orange and Los Angeles Intercounty Transportation Study (2008)** – This joint study was conducted by the OCTA and Metro, and evaluated alternatives for improving transportation infrastructure and services across the border between Orange and Los Angeles counties. The effort evaluated reuse of the PEROW/WSAB ROW with five transit alternatives: grade-separated BRT, elevated BRT, elevated LRT, hybrid LRT/BRT, and elevated high speed transit. The study demonstrated the need for and feasibility of transportation system improvements along the ROW, and recommended further evaluation of the grade-separated BRT and LRT service options. BRT and LRT service are options in this AA study.
- **Central County Corridor Major Investment Study (2010)** – This study was undertaken by OCTA to identify and assess transportation improvements to address travel demand in central Orange County. The study area was bounded by Ball Road on the north, Pacific Coast Highway on the south, Beach Boulevard on the west, and the SR-55/Costa Mesa Freeway on the east. The resulting recommendations included transit, arterial, and freeway improvement projects. One project, identified for further study, recommended utilization of the PEROW for provision of street car or BRT service, along with ramp connections to and from the SR-22 Freeway to the PEROW into the Santa Ana Civic Center area. Street car and BRT service will be evaluated as alternatives in this AA study.

A study is currently underway that may affect future use of the Orange County segment of the PEROW and will be reflected in AA study efforts:

- **Santa Ana-Garden Grove Fixed Guideway Corridor Study (2009-Present)** – The City of Santa Ana is conducting a study to evaluate the feasibility of transit service between the SARTC, the Lacy Neighborhood, Downtown Santa Ana, and the Civic Center area. A wide range of modal options was considered and reduced to the recommended street car service. Future expansion of the system from the Civic Center area would use the PEROW to extend service to Bristol Boulevard as a Phase I terminus in Santa Ana, and then to a Phase II terminus at Harbor Boulevard in Garden Grove.

Highway studies, plans, and projects with potential benefits and impacts to the Corridor Study Area are presented in the discussion of the Regional Transportation System in Section 4.0 of this report.

1.4 Current Study Effort

Support for the current AA study effort is provided by several funding and policy efforts. In Los Angeles County, future funding for a transportation project to be located on the WSAB ROW was provided through the Measure R transportation sales tax program approved in November 2008. The future WSAB

Project was included in the Recommended Plan portion of Metro's *2009 Long Range Transportation Plan* (LRTP). Adopted in October 2009, Metro's 2009 LRTP was forwarded to SCAG, and the future project was included in the *2008 Regional Transportation Plan* (RTP) and *Regional Transportation Improvement Program* (RTIP). In 2009, SCAG, in coordination with Metro and OCTA, initiated an AA for the PEROW/WSAB ROW that spans two counties. Working closely with Metro and OCTA staff, and with guidance from the AA study's elected official advisory committee, SCAG staff will recommend a preferred transportation alternative, or priority phasing of alternatives, to the SCAG Regional Council. The recommendation may be included by SCAG action in the 2012 RTP, and by Metro and OCTA Board actions in their respective LRTPs. As the owners of the PEROW/WSAB ROW, Metro and OCTA will have the option to move the recommended project forward by continuing into the preliminary engineering design and environmental review phase.

2.0 CORRIDOR DESCRIPTION

This section provides an overview of the Corridor Study Area, including the corridor boundaries, existing transportation facilities, activity centers and destinations, land uses, and demographic characteristics. This information will provide the basis to identify the purpose and need, as well as transit alternatives that address corridor mobility needs.

2.1 Corridor Study Area

Approximately 34 miles in length, the core of the PEROW/WSAB ROW Corridor Study Area is the former PE Railway ROW that extends for 20 miles at a diagonal between the city of Paramount in Los Angeles County and city of Santa Ana in Orange County. The AA effort will evaluate possible connections 12 miles north from the termination of the PEROW/WSAB ROW in Paramount to Union Station in Downtown Los Angeles, and two miles south from the ROW terminus at the edge of Santa Ana to the Santa Ana Regional Transportation Center (SARTC).

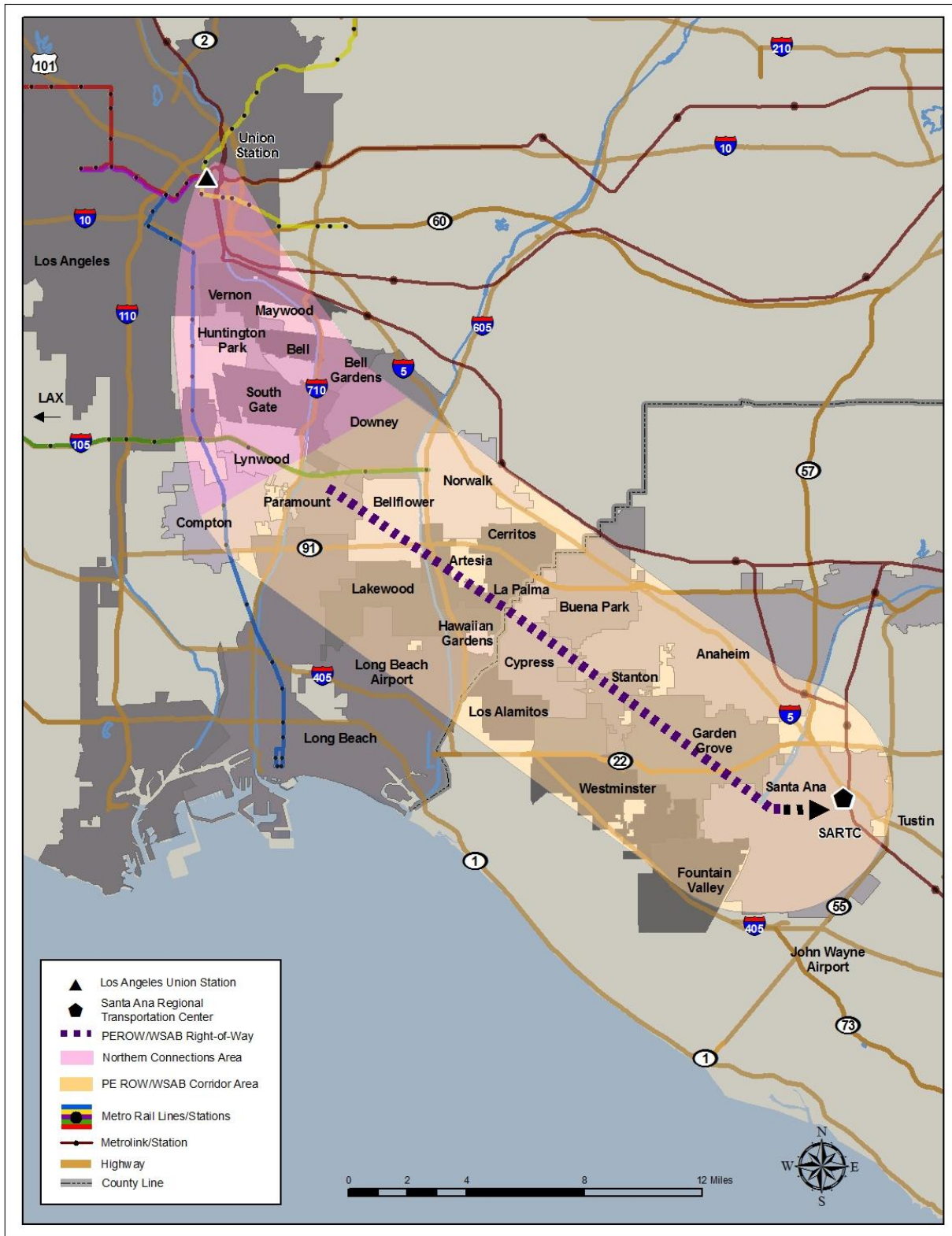
As illustrated in Figure 2.1, the approximate boundaries of the Corridor Study Area are:

- **North** – Union Station in Downtown Los Angeles, the east bank of the Los Angeles River, and the I-5/Santa Ana Freeway;
- **East** – the SARTC located in eastern Downtown Santa Ana;
- **South** – the I-405/San Diego Freeway; and
- **West** – the Metro Blue Line and I-110 Freeway north to Downtown Los Angeles.

The Corridor Study Area is divided into two sections for analytical purposes and to reflect different coordination requirements and possible phasing decisions:

1. **PEROW/WSAB Area** – centered on the former PE Railway ROW now owned by Metro and OCTA; approximately 20 miles long, with 12 miles or 60 percent of the alignment in Orange County, and the remaining eight miles in Los Angeles County. The Southern Connections Area, covering the portions of the City of Santa Ana east from where the ROW ends, is included in this area for analytical purposes. Cities in the PEROW/WSAB Area are Anaheim, Artesia, Bellflower, Buena Park, Cerritos, Compton, Cypress, Downey, Fountain Valley (part), Garden Grove, Hawaiian Gardens, Lakewood, La Palma, Long Beach (part), Los Alamitos, Lynwood, Norwalk, Orange, Paramount, Pico Rivera (part), Santa Ana, Stanton, South Gate, Tustin (part), and Westminster.
2. **Northern Connections Area** – consists of a study area extending north from the PEROW/WSAB ROW into Downtown Los Angeles, where possible connections will be explored north from the Metro Green Line/I-105 Freeway and from the Metro Blue Line on the west to several active and inactive railroad ROWs on the east. Cities included in this area are Bell, Bell Gardens, Compton, Cudahy, Downey, Huntington Park, Los Angeles (part), Lynwood, Maywood, Norwalk, Paramount (part), South Gate, and Vernon.

Figure 2.1 – Corridor Study Area Boundaries



2.2 Existing Transportation Facilities

The following transportation facilities are located in the Corridor Study Area as shown in Figure 2.1:

- **Seven freeways** – Two freeways run in a north-south direction through the study area, the I-710/Long Beach and I-605/ San Gabriel; three run in an east-west direction, the I-105/Century, SR-91/Artesia, and the SR-22/Garden Grove; and two freeways run at a diagonal approximately parallel with the PEROW/WSAB ROW, the I-5/Santa Ana to the north, and the I-405/San Diego to the south.
- **Three regional and urban rail systems** – Metrolink and Amtrak service is available from Union Station at the north end of the Corridor Study Area, and from the Santa Ana Regional Transportation Center (SARTC) at the south end. The Los Angeles County Metro Rail system is available from Union Station and the east-west running Metro Green Line is located in the northern portion of the Corridor Study Area.
- **Two regional transit centers** – There are two multi-modal facilities providing regional and local transportation system connections: Union Station in Downtown Los Angeles accommodates Metro Rail, Metrolink and Amtrak connections, along with transfers to local bus and circulator service; and the SARTC provides Metrolink and Amtrak connections, along with transfers to local, regional, and international (Mexico) bus service.

The following major transportation facilities are located adjacent to the Corridor Study Area:

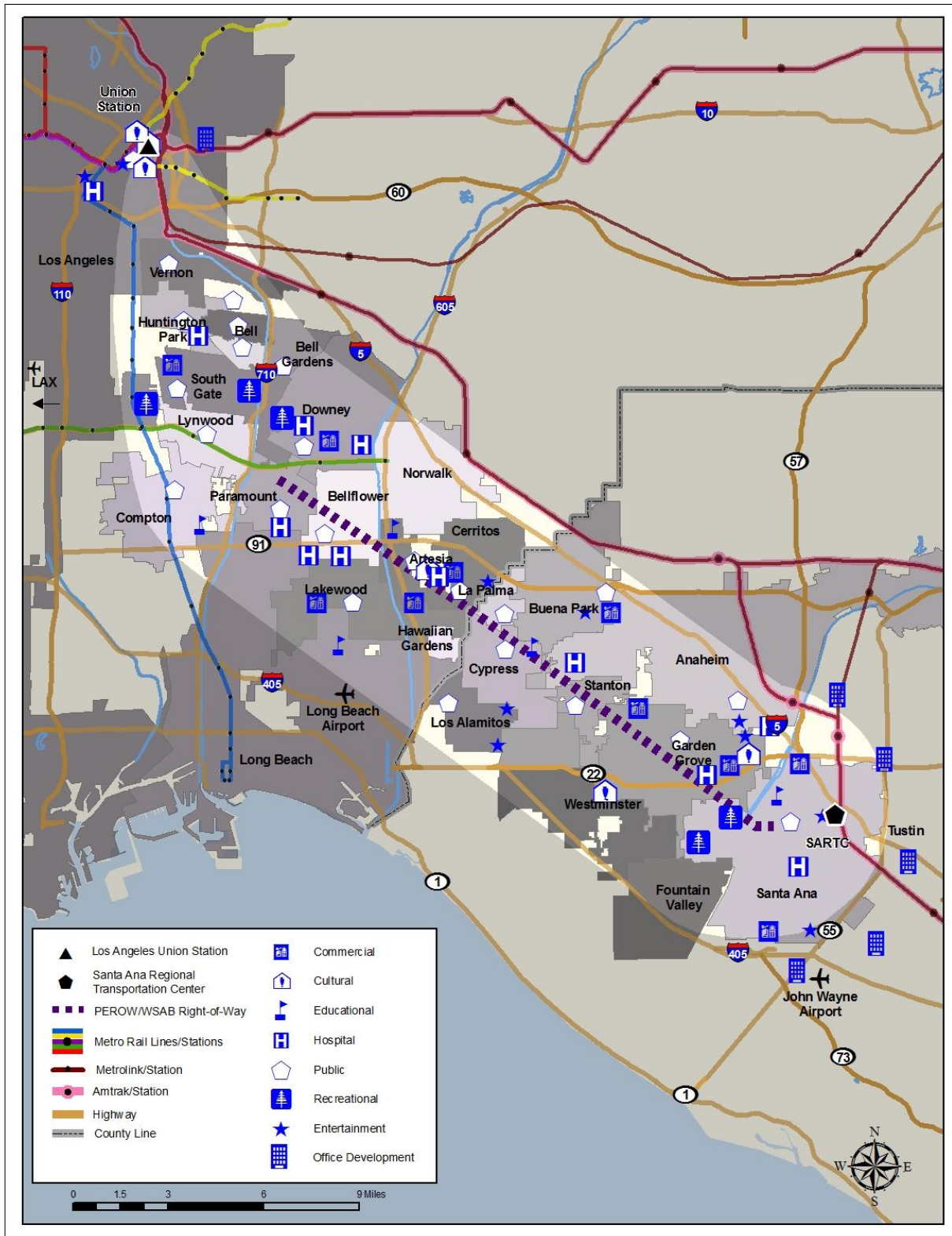
- **Two airports** – The Long Beach Municipal and John Wayne airports;
- **Three north-south freeways** – The I-110/Harbor to the west in Los Angeles County, and the SR-55/Costa Mesa, and SR-57/Orange freeways in Orange County; and
- **Regional rail service** – Amtrak and Metrolink (Orange County and 91 lines) service operates on an alignment approximately paralleling the Corridor Study Area to the north.

2.3 Activity Centers and Destinations

The Corridor Study Area contains a wide variety of civic, education, commercial, cultural, entertainment, recreational, and employment destinations, as Figure 2.2 shows. They include:

- **Public facilities**, including civic centers, community centers, and the Anaheim and Los Angeles convention centers;
- **Educational institutions**, including public and private schools and five colleges – Compton Community College, Long Beach City College, Cerritos College, Cypress College, Rancho Santiago College, and Santa Ana College;
- **Commercial areas**, including main street retail districts and regional shopping centers;
- **Cultural and entertainment venues**, including the Music Center and Staples Center in Downtown Los Angeles, the Cerritos Center for the Performing Arts, Knott's Berry Farm, Disneyland, and the Orange County Performing Arts Center;
- **Ethnic cultural centers**, including Chinatown, Little Tokyo, and Olvera Street in Downtown Los Angeles, Little India in Artesia, and Little Saigon in Westminster;

Figure 2.2 – Corridor Study Area Activity Centers and Destinations



- **Medical facilities**, including the Bellflower Medical Center, California Hospital and Medical Center, Coast Plaza Doctors Hospital, Community Hospital, Community & Mission Hospital, Paramount Suburban Medical Center, and St. Francis Medical Center;
- **Recreational facilities**, including El Dorado Regional Park, Pueblo de Los Angeles State Park, Watts Tower State Historic Park, Cerritos Regional Park, and Centennial Regional Park;
- **Office space** in Downtown Los Angeles, Anaheim, Santa Ana, and Orange; and
- **Industrial, manufacturing, and warehousing facilities** in Bell, Bell Gardens, Cudahy, Downey, Huntington Park, Los Angeles, Lynwood, South Gate, and Vernon.

2.4 Corridor Land Uses

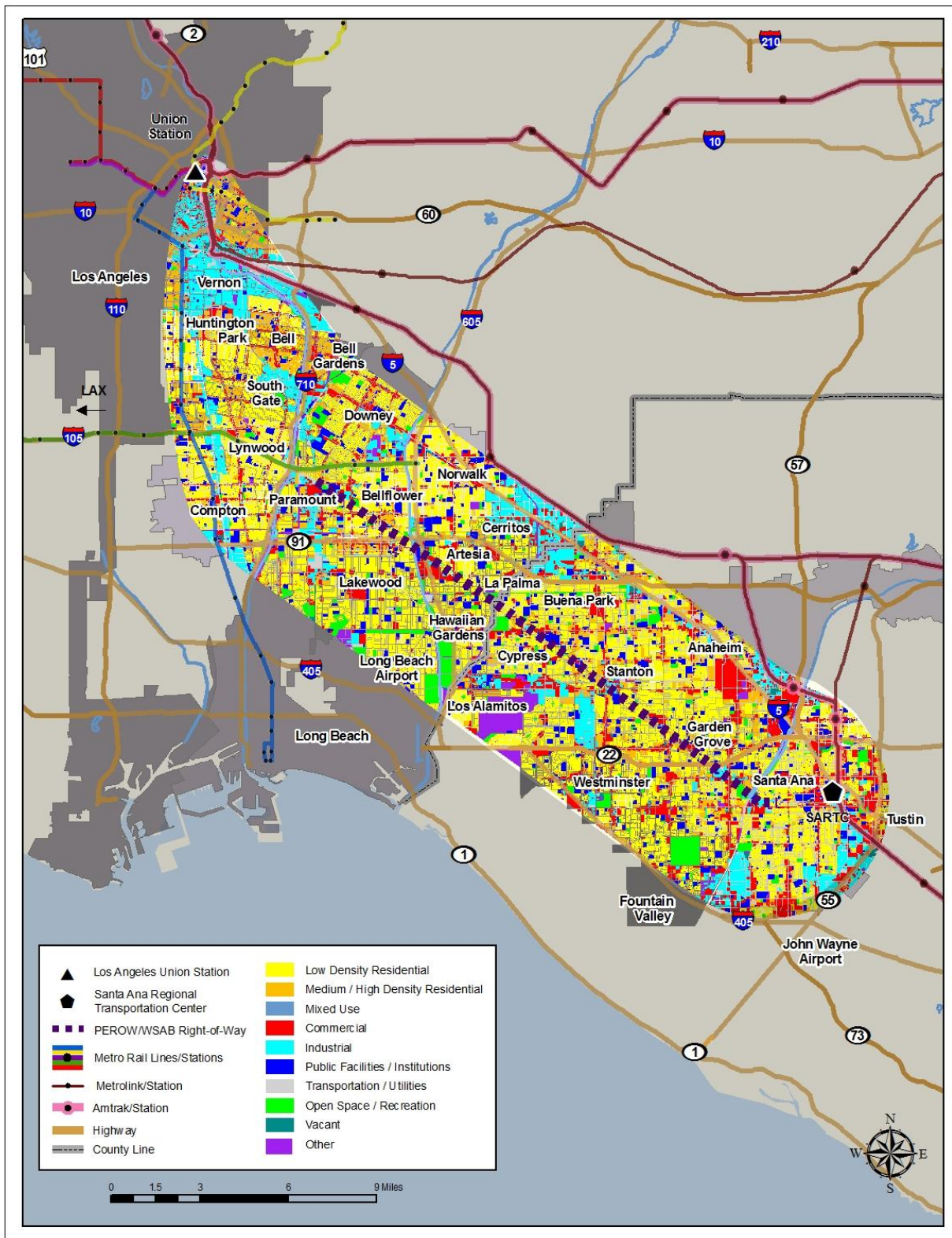
The mix of land uses in the Corridor Study Area will play an important role in determining the potential benefits, as well as the possible impacts, of implementing a transportation system improvement. The study area has a diverse mix of land uses as shown in Figure 2.3 and Table 2.1, including:

- Residential development is the highest percentage of land use with 50 percent of the property in the Corridor Study Area devoted to single-family homes and multi-family apartments and townhouses. Much of the housing in the Los Angeles County portion of the corridor was built during the 1930s to 1950s era. Southern California growth pushed south into Orange County in the 1960s; the Orange County portion of the corridor has older housing stock with much of it built during the 1960s and 1970s.
- Approximately 30 percent of the land is occupied with commercial and industrial uses, which is higher in the Northern Connections portion of the study area. This area was the manufacturing heart of Southern California up to the 1950s. A concentration of older industrial, manufacturing, and warehousing space is located in Los Angeles, Vernon, Bell, Bell Gardens, Cudahy, Downey, Huntington Park, Lynwood, and South Gate.
- The remaining study area land is occupied with a mix of uses including: public facilities, including civic centers, hospitals, and educational facilities; parks and recreational uses; freeways, streets, flood channels, and utilities; and other uses. A higher percentage of land in the Northern Connections Area is devoted to transportation and utility activities due to the freight rail and related intermodal facilities located in Los Angeles, Vernon, Huntington Park, and South Gate.

Table 2.1 – Percentage of Current Land Uses in Corridor Study Area

Land Uses	PEROW/WSAB Area	Northern Connections Area	Corridor Study Area
Low-Density Residential	32%	29%	30%
High-Density Residential	20%	19%	20%
Commercial	15%	13%	14%
Industrial	11%	16%	14%
Public Facilities and Institutions	9%	9%	9%
Open Space and Recreation	5%	4%	5%
Transportation and Utilities	4%	7%	5%
Other	4%	3%	3%

Figure 2.3 – Corridor Study Area Land Uses



2.5 Demographic Information

This section provides an overview of the demographic characteristics within the Corridor Study Area, including existing and forecast population and employment, and existing low income and transit dependent households, and ethnicity. The resulting information is identified for the Corridor Study Area as well as for the two study area sections previously identified. For the purposes of the demographic analysis, the Corridor Study Area is defined as approximately eight miles in width. Demographic average information for Los Angeles County is provided in two ways: the county average which represents the entire county including large portions of mountainous, largely uninhabited land; and the urbanized county average representing only the developed, inhabited portions.

Overview

The Corridor Study Area was recommended for study because of the following characteristics:

- **High population growth** – The study area population is projected to grow by 12 percent, with more than 550,000 new residents by 2035.
- **High population density** – The existing population density is and will remain 1.5 to 3.0 times higher than the urbanized Los Angeles and Orange county averages respectively. Between 2006 and 2035, the study area population density is forecasted to increase by 12 percent to an average of just under 12,000 people per square mile.
- **High level of employment** – Between 2006 and 2035, employment will increase by 13 percent in the PEROW/WSAB Area and decline by five percent in the Northern Connections Area. Even with the identified decrease in jobs, the study area will retain a significant portion of Los Angeles County's employment, with 1.1 million jobs or 21 percent of that county's total. By 2035, the Orange County portion will have 2.0 million jobs, or 44 percent of that county's total.
- **Increasing employment density** – Similar to population density, corridor employment density is 1.6 to 2.7 times higher than in urbanized Los Angeles and Orange counties as a whole. This will continue in 2035, with employment densities ranging from 1.6 to 2.2 times higher than in urbanized Los Angeles County and Orange County respectively.
- **High number of low-income households** – More than 36 percent of all Corridor Study Area households are designated as low-income – twice the Orange County average and 20 percent higher than the urbanized Los Angeles County average. Low-income households are distributed throughout the study area, with the highest number located in the South Los Angeles, Downtown Los Angeles, Central Los Angeles West, and Interior South Bay subregions.
- **High number of transit-dependent households** – Sixteen percent of households in the corridor lack access to an automobile – three times the Orange County average and 20 percent higher than the Los Angeles County average.

2.5.1 Population

In 2006, the Corridor Study Area was home to more than 4.5 million residents as Table 2.2 shows. Approximately 3.3 million lived in the Los Angeles County portion, or 33 percent of that county's total population, and more than 1.2 million lived in the Orange County portion, or 42 percent of that county's total population. By 2035, the Corridor Study Area's population is projected to grow by more than

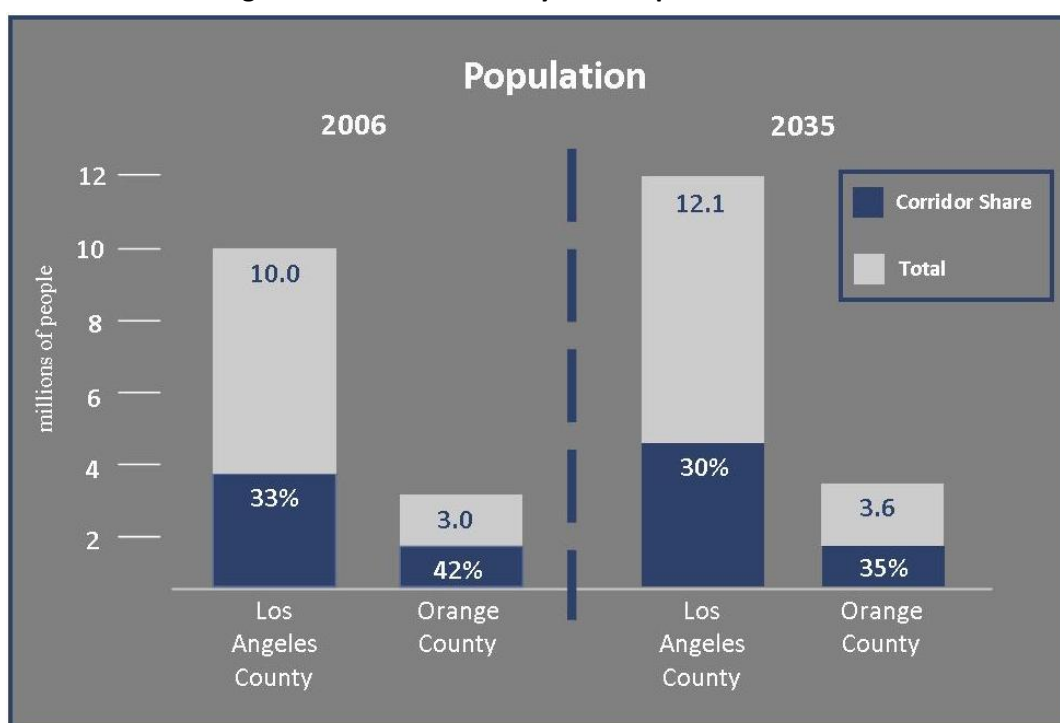
550,000 residents, or 12 percent. Future population growth is forecasted to be slightly higher in the PEROW/WSAB Area than the Northern Connections Area.

Table 2.2 – Future Growth in Corridor Study Area Population (2035)

Areas	2006	2035	Change	
			Residents	Percentage
PEROW/WSAB Area	2,264,000	2,568,000	304,000	13%
Northern Connections Area	2,272,000	2,526,000	254,000	11%
Corridor Study Area	4,535,000	5,094,000	558,000	12%

Source: Metro Model, 2006.

Figure 2.4 – Corridor Study Area Population Growth



2.5.2 Population Density

In 2006, Corridor Study Area population densities were more than four times the Los Angeles County average, 1.5 higher than the urbanized county average, and 2.9 times higher the Orange County average. By 2035, study area population densities are forecasted to increase by 12 percent to an average of 11,990 people per square mile as shown in Table 2.3. The PEROW/WSAB Area population density will experience a higher percentage density increase, but the Northern Connections Area will remain denser with more than 14,000 residents per square mile. In 2035, study area population densities will remain higher than the urbanized Los Angeles and Orange County averages by 1.5 to 2.7 times respectively.

Figure 2.5– Population Density (2035)

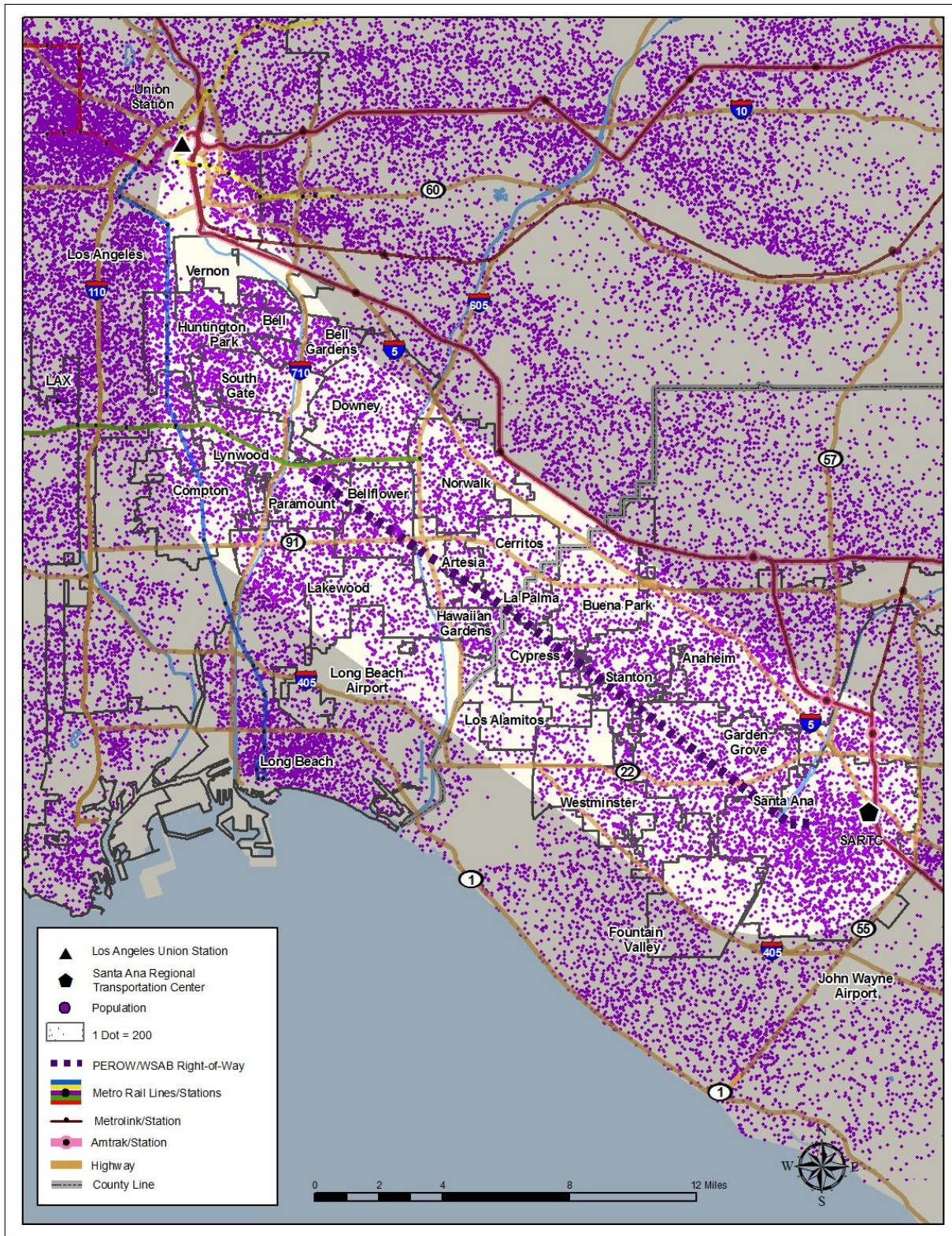
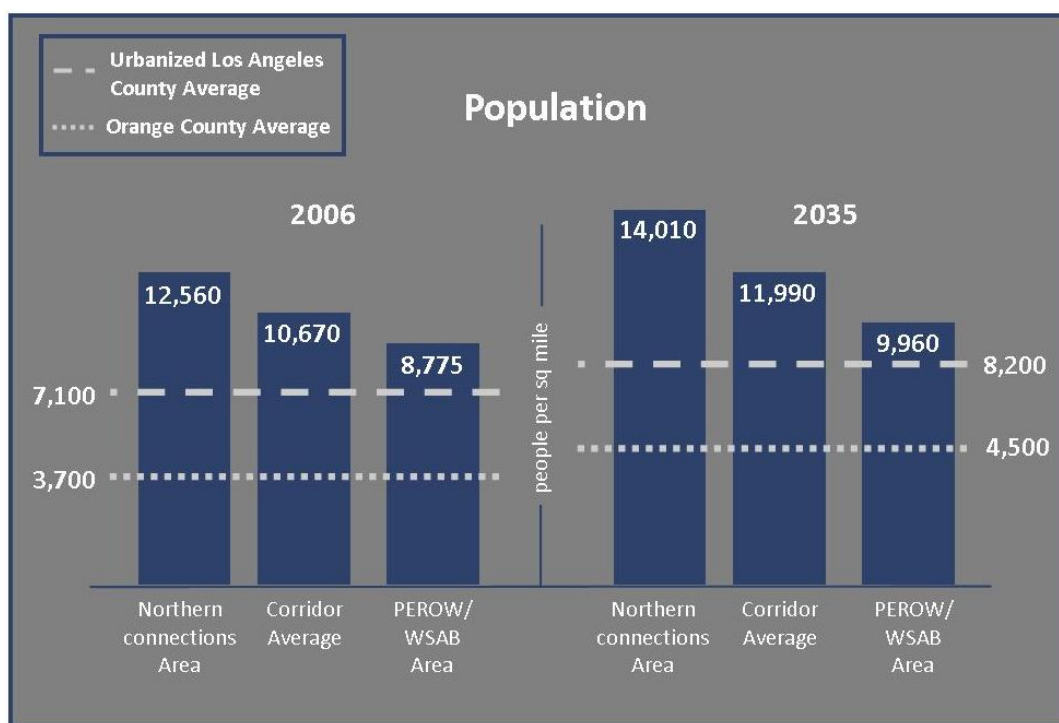


Table 2.3 – Future Growth in Corridor Study Area Population Density (2035)

Areas	2006	2035	Change	
	Residents Per Square Mile	Residents Per Square Mile	Residents Per Square Mile	Percentage Growth
PEROW/WSAB Area	8,775	9,960	1,185	14%
Northern Connections Area	12,560	14,010	1,450	12%
Corridor Study Area	10,670	11,990	1,320	12%
Orange County Average	3,730	4,505	775	21%
Los Angeles County Average	2,515	3,045	530	21%
Urbanized County Average	7,100	8,210	1,110	16%

Source: Metro Model, 2006.

Figure 2.6 – Corridor Study Area Population Density Growth



2.5.3 Employment

Currently, the Corridor Study Area has more than 2.2 million jobs (Table 2.4). Approximately 1.5 million are located in Los Angeles County, accounting for 32 percent of the county's total employment. The remaining 700,000 are located in Orange County, where they constitute 46 percent of that county's total employment. By 2035, employment in the Corridor Study Area is forecasted to grow by about four percent or approximately 86,000 jobs. Employment growth is projected to be strong in the Orange County portion of the corridor, with a 19 percent increase in total jobs, while the Los Angeles County portion will lose four percent of its current employment due to the continued loss of manufacturing and warehousing jobs.

Table 2.4 – Future Growth in Corridor Study Area Employment (2035)

Areas	2006	2035	Change	
			Jobs	Percentage
PEROW/WSAB Area	1,107,000	1,247,000	140,000	13%
Northern Connections Area	1,130,000	1,076,000	(54,000)	(5%)
Corridor Study Area	2,237,000	2,323,000	86,000	4%

Source: Metro Model, 2006.

The Northern Connection Area has a concentration of older industrial uses as this area was once the manufacturing heartland of Southern California, and employment has suffered disproportionately from both the long term structural changes to the U.S. economy and the recent but severe recession. For at least two decades, most metropolitan economies have been shifting away from manufacturing to service sector jobs, as have Los Angeles and Orange counties. Over the past two decades, these two counties combined have lost more than a half million manufacturing jobs.

Table 2.5 – Long Term Loss of Manufacturing Employment

Areas	1990	1995	2000	2005	2010	Change 1990-2010
Los Angeles County	812,000	628,100	612,200	471,700	324,200	(487,800)
Orange County	225,400	189,600	215,500	182,900	150,200	(75,200)
Two County Total	1,037,400	817,700	827,700	654,600	524,400	(563,000)

Source: California Employment Development Department, 2010.

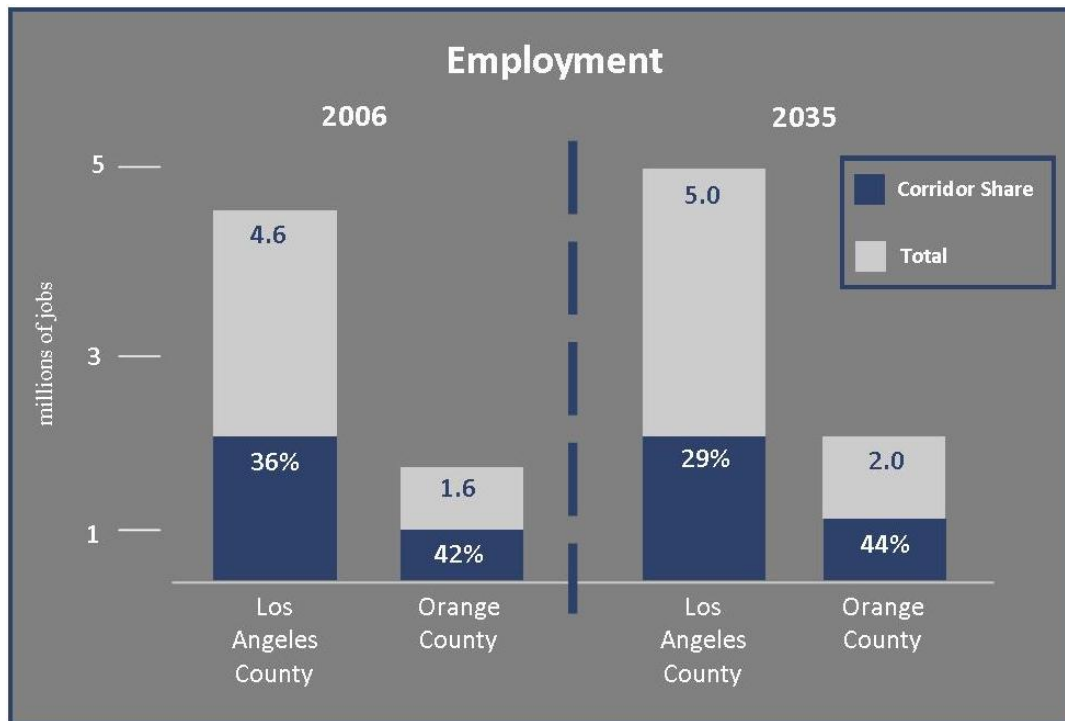
The Corridor Study Area has experienced more than its share of the impact of this structural change for several reasons:

- With technological improvements to production processes, the same output value in manufacturing can be achieved with considerable less labor input. Over time, more and more of the labor component of production cost has been shifted to investment in technology.
- A large number of manufacturers have moved out of Southern California to lower production cost areas such as the southeastern U.S., or to developing countries in order to remain viable in an increasingly competitive global economy.
- Manufacturing and particularly distribution firms have relocated to avoid the increasing congestion for trucking. Cities in the Inland Empire have developed major distribution centers to replace the functions that were once performed in this corridor.

Short term projections (for 2008 to 2018) prepared by the California Employment Development Department for both Los Angeles and Orange counties show a continued decline in manufacturing employment, with the decline being sharper for Los Angeles County. This is a long term trend that is expected to continue. Future employment growth will be in the service industry with Education and Health Care jobs experiencing the highest increase – approximately 26 percent in Los Angeles County and 22 percent in Orange County. Other employment areas forecasted to grow are: Professional Services; Leisure and Hospitality, including Food and Entertainment; and Administrative and Support.

In the Corridor Study Area, much of the future job growth is projected to occur in Orange County, particularly the western and central areas. Reasons include the closeness of western Orange County to the beach with better air quality and a milder climate, which affects executive housing decisions. Central Orange County is attractive because of land availability for employment growth, available professional workforce, and better peak period access to the labor market (as compared to Los Angeles County and southern Orange County).

Figure 2.7 – Corridor Study Area Employment Growth



2.5.4 Employment Density

Currently, the Corridor Study Area has an average employment density of 5,270 jobs per square mile, which is more than 2.7 times the Orange County average and 1.6 times that of urbanized Los Angeles County (Table 2.6). These trends are projected to continue in 2035, with densities ranging from 2.2 to 1.6 times higher than each county's average. Downtown Los Angeles (14,130) and Northeast Orange County (13,510) are projected to have the highest job density.

Figure 2.8 – Corridor Study Area Employment Density (2035)

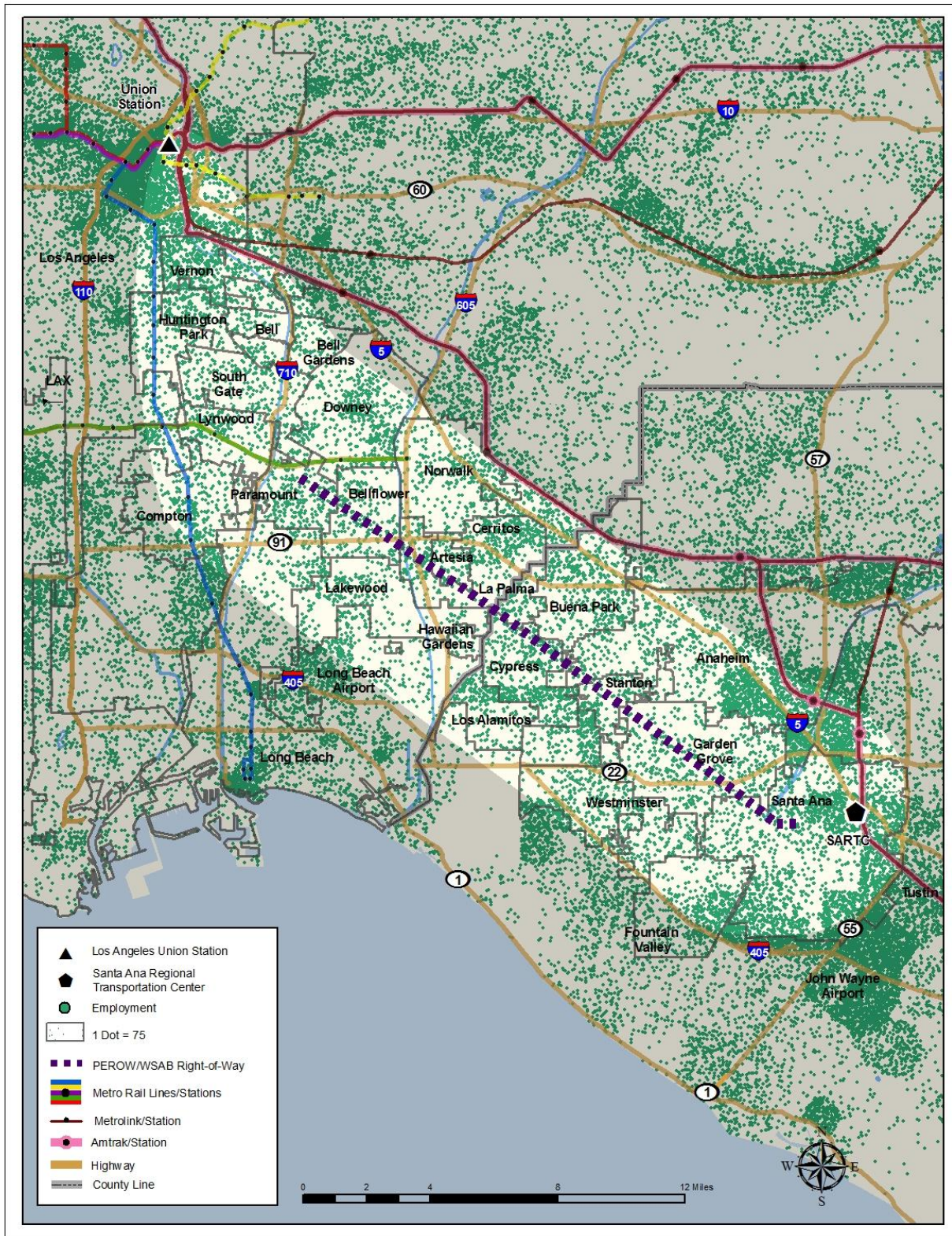
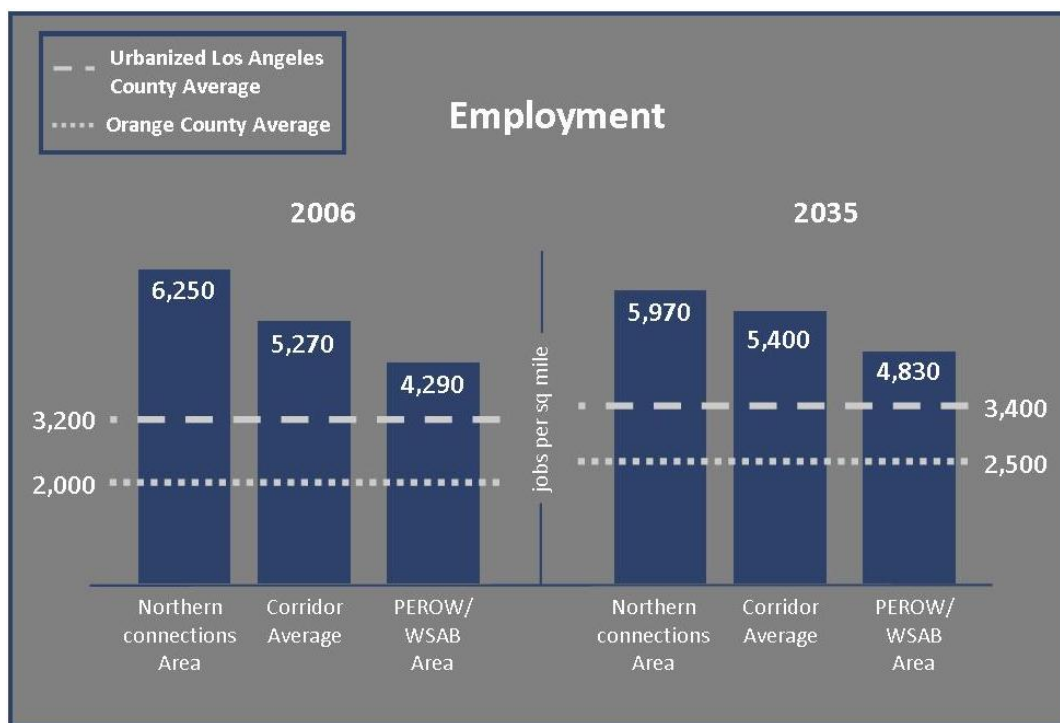


Table 2.6 – Future Growth in Corridor Study Area Employment Density (2035)

Areas	2006	2035	Change	
	Jobs Per Square Mile	Jobs Per Square Mile	Jobs Per Square Mile	Percentage Growth
PEROW/WSAB Area	4,290	4,830	540	13%
Northern Connections Area	6,250	5,970	(280)	(4%)
Corridor Study Area	5,270	5,400	130	2%
Orange County Average	1,980	2,480	500	25%
Los Angeles County Average	1,170	1,270	100	9%
Urbanized Average	3,215	3,380	165	5%

Source: Metro Model, 2006.

Figure 2.9 – Corridor Study Area Employment Density Growth



2.5.5 Low-Income Households

In the Corridor Study Area, approximately 450,000 households, or 36 percent of the corridor's households, have an annual income of \$25,000 or less. This is a higher percentage than in Orange County (18 percent), or in Los Angeles County (30 percent). The number and percentage of low-income households is higher in the Northern Connections Area than in the PEROW/WSAB Area, as Table 2.7 shows. In the areas with the highest number of low-income households, the percentage ranges from 180 to 200 percent higher than the county average. With the forecast loss of jobs in the Northern Connections Area, the high number and percentage of low-income households in the Los Angeles County portion of the study area is anticipated to continue and increase.

Figure 2.10 – Corridor Study Area Low-Income Households (2006)

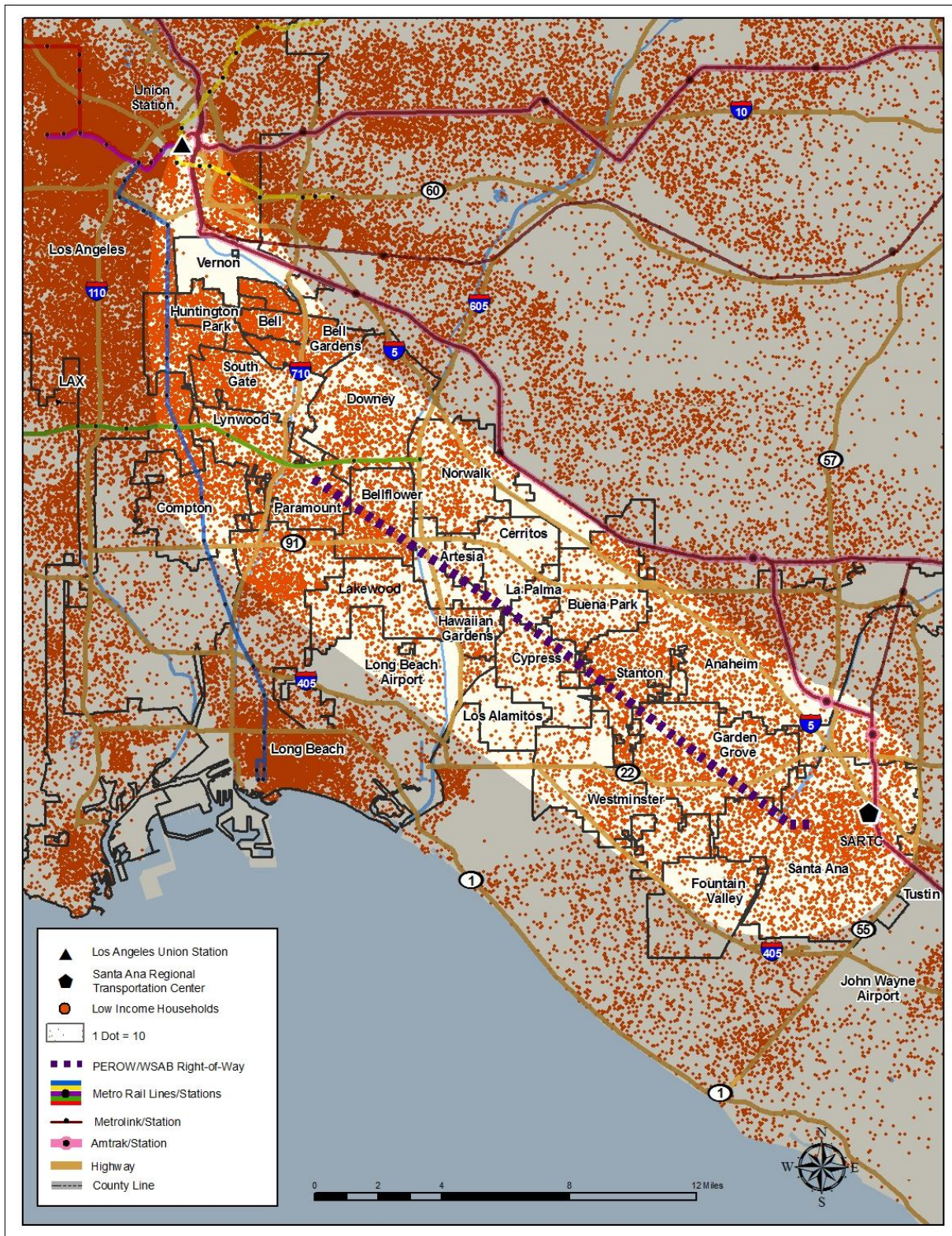


Table 2.7 – Low-Income Households in Corridor Study Area (2006)

Areas	Total Households	Low-Income Households (Number)	Low-Income Households (Percentage)
PEROW/WSAB Area	621,000	168,000	27%
Northern Connections Area	624,000	280,000	45%
Corridor Study Area	1,245,000	448,000	36%

Source: Metro Model, 2006.

2.5.6 Transit-Dependent Households

Transit-dependent households are defined as households without access to an automobile. Transit-dependence has a strong inverse correlation with household income. As presented in Table 2.8, the Corridor Study Area has a high proportion (16 percent) of transit-dependent households, when compared to the Los Angeles and Orange County averages of 13 and six percent respectively. The subregions with the highest percentage of transit-dependent households are all located in the Northern Connections Area, and the subregions with the highest number of transit-dependent households are Central Los Angeles West (44,000) and Downtown Los Angeles (35,000).

Table 2.8 – Transit-Dependent Households in Corridor Study Area (2006)

Areas	Total Households	Transit-Dependent Households (Number)	Transit-Dependent Households (Percentage)
PEROW/WSAB Area	621,000	56,000	9%
Northern Connections Area	624,000	144,000	23%
Corridor Study Area	1,245,000	200,000	16%

Source: Metro Model, 2006; U.S. Census, 2000.

2.5.7 Ethnicity

According to the U.S. Census, and similar to Southern California in general, the Corridor Study Area has a diverse population (Table 2.9). The three largest ethnic groups are identified as Hispanic (61 percent), White (19 percent), and Asian/Pacific Islander (10 percent).

Table 2.9 – Ethnicity in Corridor Study Area

Subregions	White	African-American	Hispanic	Asian/Pacific Islander	Multi-Race
PEROW/WSAB Area	28%	7%	51%	12%	2.0%
Northern Connections Area	10%	10%	71%	8%	1.0%
Corridor Study Area	19%	8.5%	61%	10%	1.5%

Source: U.S. Census, 2000.

Figure 2.11 – Corridor Study Area Transit-Dependent Households (2006)

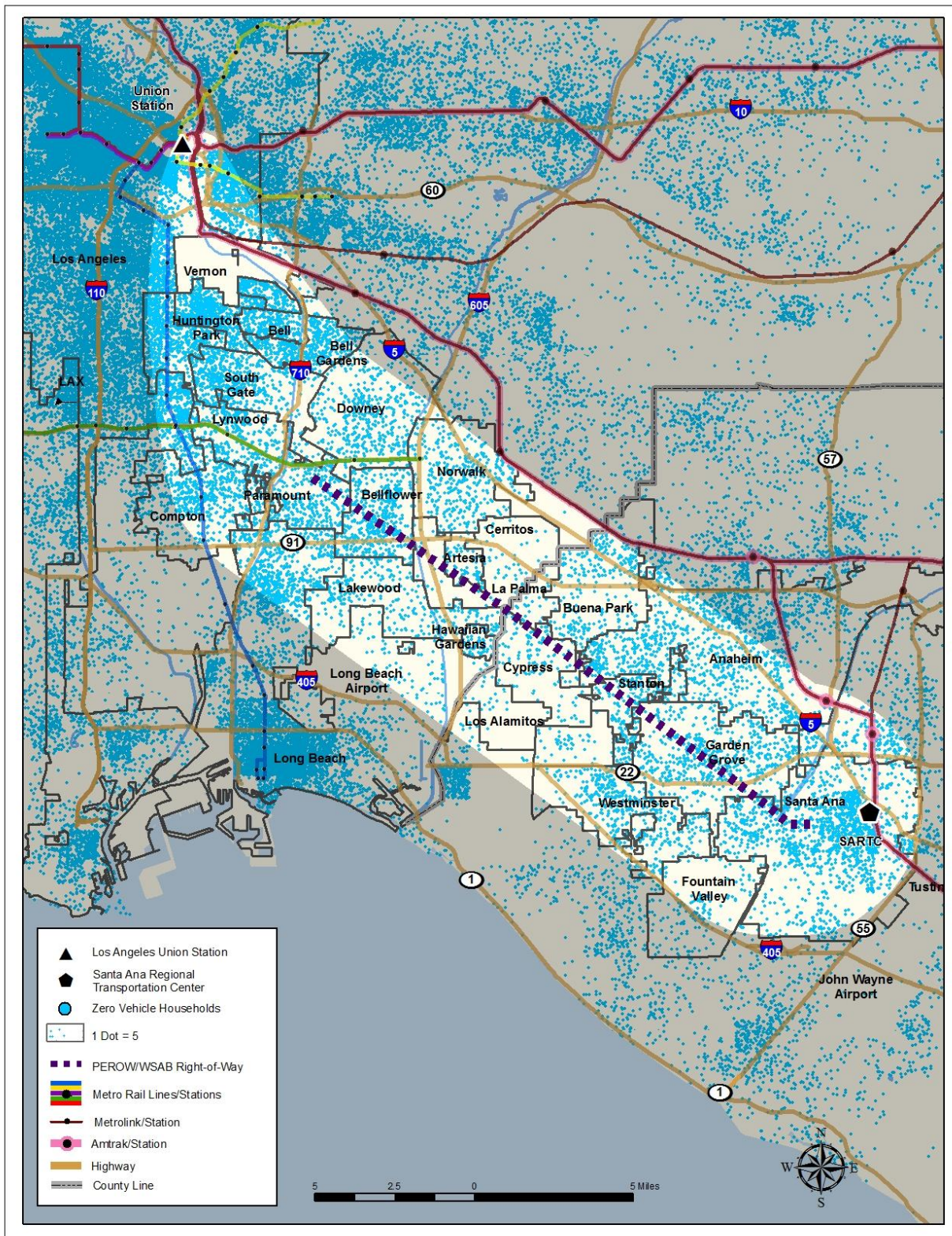
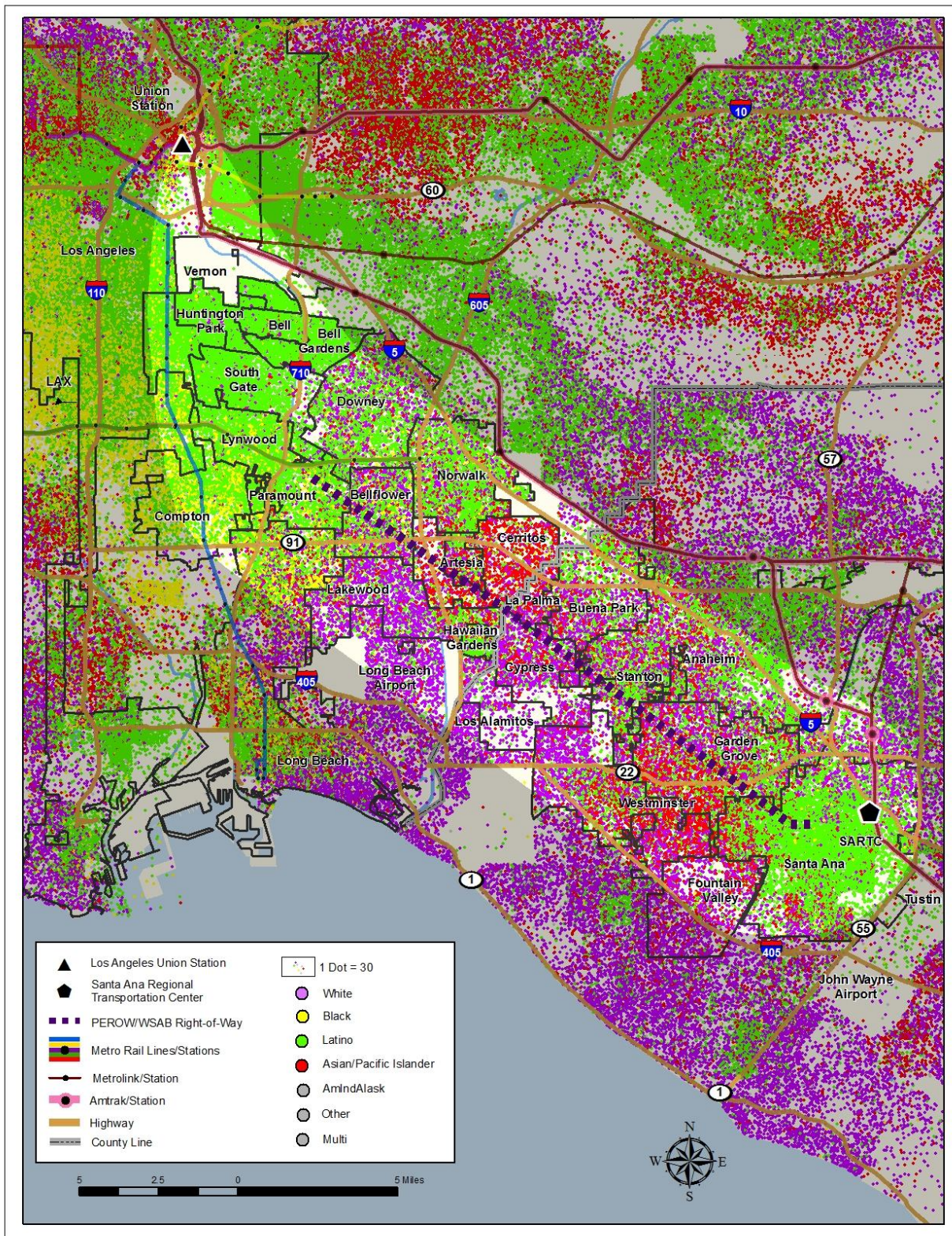


Figure 2.12 – Corridor Study Area Ethnicity



3.0 TRAVEL DEMAND

This section provides an overview of the corridor's travel markets and characteristics, and current and future travel demand generated by the demographic and community factors discussed in section 2.0. An analysis of Corridor Study Area travel demand contributes to the transportation decision-making process by identifying and evaluating factors that frame the need for transportation system improvements, and will be used to assess the feasibility of possible solutions. The following factors, discussed in Section 2.0, contribute to both the identification of the corridor's mobility challenges and travel demand patterns:

- Current and future population, including density and distribution;
- Current and future employment, including density and distribution;
- Future population and employment growth;
- Low-income and transit-dependent households; and
- Activity centers and destinations.

3.1 Travel Markets and Characteristics

The Corridor Study Area is a densely developed area covering the most active parts of Los Angeles and Orange counties. Now, and in the future, this corridor is home to one-third of Los Angeles County residents, and half of Orange County's. With 4.5 million current residents, the study area's population is approximately twice that of the city of San Diego, the second largest city in California. The Corridor Study Area will continue to contain some of the region's densest employment centers ranging from major office development centers to concentrations of industrial, manufacturing, and intermodal facilities. From an employment perspective, the study area contains one-third of Los Angeles County jobs and almost half of Orange County's – four times San Diego's employment. Future forecasts show shifting employment patterns, with the northern portion of the corridor continuing to experience the loss of manufacturing and warehousing jobs, emphasizing the importance of connecting this area's employees to other regional work markets. In the southern portion, Orange County will experience increased employment by 2035, making provision of expanded transportation capacity key to maintaining corridor mobility and quality of life.

Travel Markets

The Corridor Study Area contains a wide variety of employment, educational, commercial, cultural, entertainment, and recreational destinations – resulting in a diverse set of travel markets. Many of these destinations attract trips from throughout Los Angeles and Orange counties, and beyond. The corridor's primary travel markets are:

- Commuters accessing major office employment areas located in Los Angeles, Anaheim, Costa Mesa, Orange, and Santa Ana;
- Commuters accessing industrial, manufacturing, and intermodal facilities in Los Angeles, Bell, Cudahy, Downey, Huntington Park, Lynwood, South Gate, and Vernon;
- Students, teachers, and employees traveling to public and private educational institutions, including five existing and one planned community colleges;

- Visitors, including residents and tourists, accessing entertainment centers and special event generators such as Staples Center, Disneyland, Knott's Berry Farm, and the Crystal Cathedral;
- Residents and visitors traveling to the performing arts centers in the cities of Los Angeles, Cerritos, and Costa Mesa;
- Shoppers traveling to the corridor's main street retail districts, such as Pacific Boulevard in Huntington Park and Downtown Santa Ana, and regional shopping centers, including Lakewood Center Mall, Los Cerritos Center, the City Center, and South Coast Plaza;
- Residents and visitors traveling to shop or attend special events in one of the corridor's ethnic cultural centers, including Olvera Street, Chinatown, Little Tokyo, Little India, and Little Saigon;
- Patients, visitors, and employees traveling to the corridor's many hospitals and medical facilities, including UC Irvine Medical Center in Orange and the California Hospital and Medical Center in Downtown Los Angeles;
- Out-of-town visitors traveling to the Anaheim and Los Angeles convention centers, and adjacent hotels, food, shopping, and entertainment activities;
- Residents and visitors traveling to recreational facilities, including state, regional, and local parks; and
- Transit-dependent residents, including senior, student, disabled, and low-income residents desiring to make transit connections to the regional bus and rail system.

Travel Characteristics

Typically, the most frequent type of trip is travel to work. This trip type occurs during a limited window of time (morning and evening peak periods) and results in significant congestion on a majority of the Corridor Study Area's highway system. Reflecting the predominant current transportation investment in the corridor's highway system, travel to work is characterized by a high level of automobile use. A summary of the travel characteristics of the Corridor Study Area, along with the two study area sections, is presented in Table 3.1. Trip types include: single-occupant vehicle (SOV), carpool, transit, and other, such as by bicycle or walking. The PEROW/WSAB Area has much higher work access by automobile (91 percent) than the Northern Connections Area (80 percent). Conversely, the Northern Connections Area's transit mode split is three times that of the PEROW/WSAB Area, perhaps reflecting the higher percentage of low-income (45 percent versus 27 percent) and transit-dependent (23 percent versus nine percent) households, and the wider range of transit options available.

Table 3.1 – Corridor Study Area: Mode Split to Work (2000)

Subregions	SOV	Carpool	Transit	Other
PEROW/WSAB Area	73%	18%	5%	4%
Northern Connections Area	60%	20%	15%	5%
Corridor Study Area	67%	19%	10%	4%

Source: U.S. Census, 2000.

3.2 Travel Demand

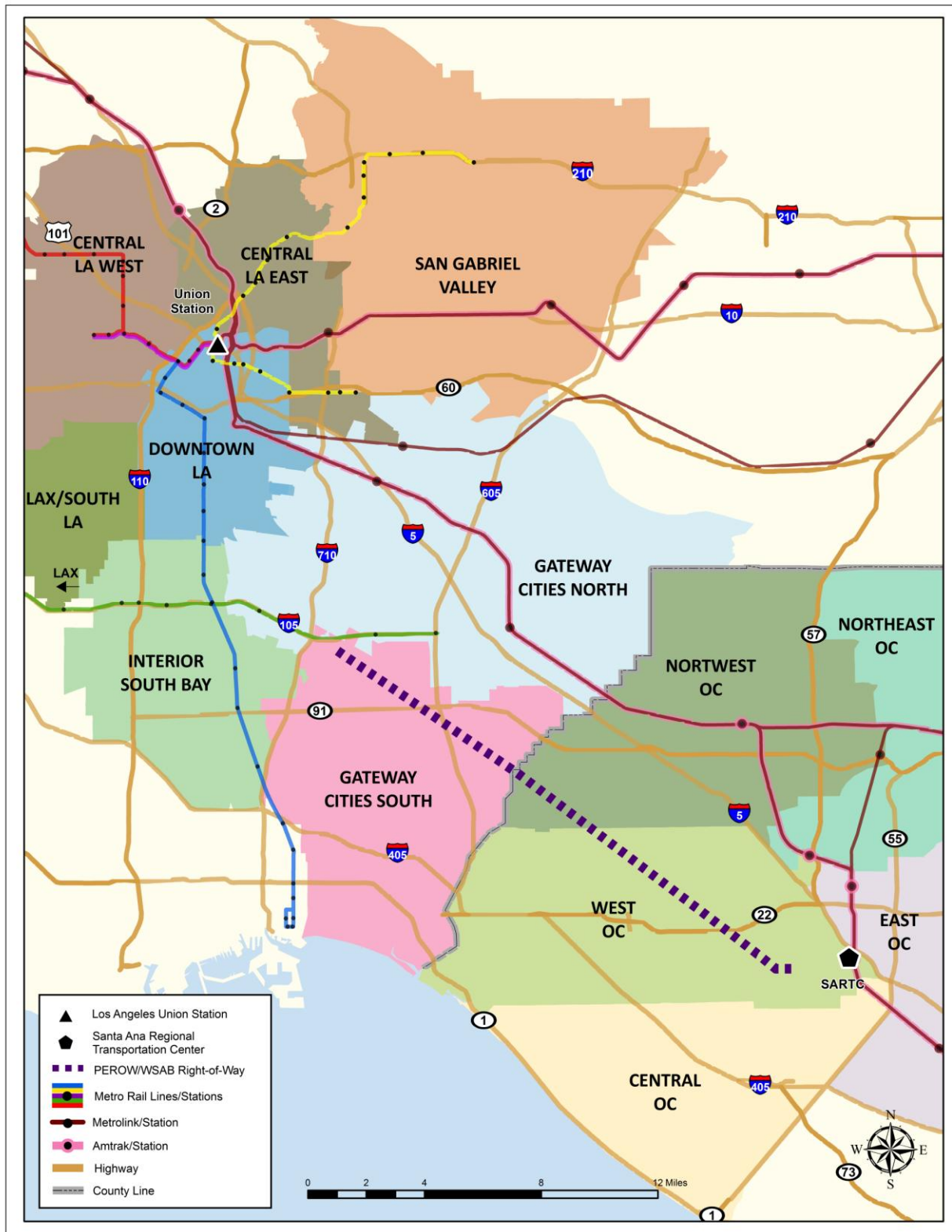
Given the projected future growth in the corridor's population and employment between 2006 and 2035, there will be a corresponding increase in daily travel. Identification of current and future travel demand was based on information from the Metro model, which divides the region into smaller subregions for analytical purposes. The resulting travel demand information is based on aggregate of the portion of each subregion located in the Corridor Study Area as listed in Table 3.2 and illustrated in Figure 3.1. While all of the listed subregions are included in the travel analysis, the proposed project alignment would operate through the following seven subregions:

- Downtown Los Angeles;
- Gateway Cities North;
- Gateway Cities South;
- West Orange County;
- Northwest Orange County;
- Central Orange County; and
- East Orange County.

Table 3.2 – Corridor Subregions Defined in Metro Model

Subregions	Cities
Los Angeles County	
Central Los Angeles East	East Los Angeles, the northern half of Chinatown, and the Echo Park, Glassell Park, Cypress Park, Highland Park, and Mt. Washington sections of Los Angeles
Central Los Angeles West	Westlake, Echo Park, Silverlake, and Exposition Park sections of Los Angeles
Downtown Los Angeles	Vernon, Huntington Park, the southern portion of Chinatown, Downtown, Boyle Heights, Walnut Park, and Florence sections of Los Angeles
Gateway Cities North	Bell, Bell Gardens, Cudahy, Downey, Lynwood, Norwalk, and South Gate
Gateway Cities South	Artesia, Bellflower, Cerritos, Hawaiian Gardens, Lakewood, a portion of Long Beach, and Paramount
Interior South Bay	Compton and Watts, Willowbrook, and Walnut Park sections of Los Angeles
LAX/Inglewood/South Los Angeles	Crenshaw and Hyde Park sections of Los Angeles
San Gabriel Valley	East Los Angeles, Pasadena, and South Pasadena
Orange County	
Central Orange County	Costa Mesa, Fountain Valley, Santa Ana, and Westminster
East Orange County	Santa Ana and portions of Orange, Tustin, and Irvine
Northeast Orange County	Anaheim and a portion of Orange
Northwest Orange County	Anaheim, Cypress, La Palma
West Orange County	Anaheim, Cypress, Garden Grove, Los Alamitos, Orange, Rossmore, Santa Ana, Stanton, and Westminster

Figure 3.1 – Corridor Subregions Defined in Metro Model



Between 2006 and 2035, Corridor Study Area travel will increase by 36 percent, or 12.8 million new daily trips will be added to the corridor's constrained highway system (Table 3.3). In 2035, a high percentage (65 percent) of the total daily vehicular travel will be to destinations outside of the corridor, but the total increase of 16.7 million trips remaining in the 34-mile by eight-mile corridor will be significant. Of the 2.6 million additional daily trips originating and remaining in the study area, a large portion (63 percent) will occur in the Los Angeles County portion (1.6 million), but the percentage of increase will be higher in Orange County (19 percent) reflecting projected employment growth. Corridor subregions experiencing the highest increase in daily trips will be West Orange County (308,000) and East Orange County (257,000).

Table 3.3 – Total Corridor Vehicle Trip Summary by Subregion

Corridor Subregions	2006	2035	Difference	Percent Difference
Central Los Angeles East	572,600	715,800	143,200	25%
Central Los Angeles West	1,429,000	1,700,900	271,900	19%
Downtown Los Angeles	1,028,200	1,177,900	149,700	15%
Gateway Cities North	1,730,400	1,949,900	219,500	13%
Gateway Cities South	1,267,500	1,487,900	220,400	17%
Interior South Bay	776,700	937,600	160,900	13%
LAX/Inglewood/South Los Angeles	736,200	831,200	95,000	13%
San Gabriel Valley	1,692,300	2,034,200	341,900	20%
Los Angeles County	9,232,900	10,835,400	1,602,500	17%
Central Orange County	1,023,700	1,096,700	73,000	7%
East Orange County	881,500	1,138,800	257,300	29%
Northeast Orange County	560,600	661,300	100,700	18%
Northwest Orange County	1,277,500	1,496,600	219,100	17%
West Orange County	1,202,900	1,510,900	308,000	26%
Orange County	4,946,200	5,904,300	958,100	19%
Corridor Travel Total	14,179,100	16,739,700	2,560,600	18%
Travel to Other Subregions	20,982,300	31,191,100	10,208,800	49%
Total Travel	35,161,400	47,930,800	12,769,400	36%

Source: Metro Model, 2006.

3.3 Travel Patterns

An analysis of corridor-based travel patterns in 2035 was developed to identify the potential for a transit system improvement:

- **Internal trips**, or local travel that both originates and remains within a single subregion; and
- **Subregion-to-subregion trips**, or study area travel to another destination within the Corridor Study Area, whether in Los Angeles or Orange county.

As shown in Table 3.4, with the exception of Downtown Los Angeles, more than half of the future corridor travel will both originate and remain in the same subregion, demonstrating a strong need to serve local trip needs. A majority of the travel originating in either Los Angeles or Orange County will remain in the same county. The exceptions are the subregions bordering the county line: Gateway Cities South and Northwest and West Orange County.

The high number of internal or local trips demonstrates a strong possibility to provide a future high-capacity transit system or improved local bus and circulator service. To provide a perspective, urban rail travel has been successfully implemented in several subregions of Los Angeles County: Downtown Los Angeles (Metro Blue, Purple, and Red lines); Central Los Angeles East (East Los Angeles Metro Gold Line); Central Los Angeles West (Red and Purple lines); LAX/Inglewood/South Los Angeles (future Crenshaw Line); and San Gabriel Valley (Pasadena Metro Gold Line).

Table 3.4 – Corridor-based Trip Destinations (2035)

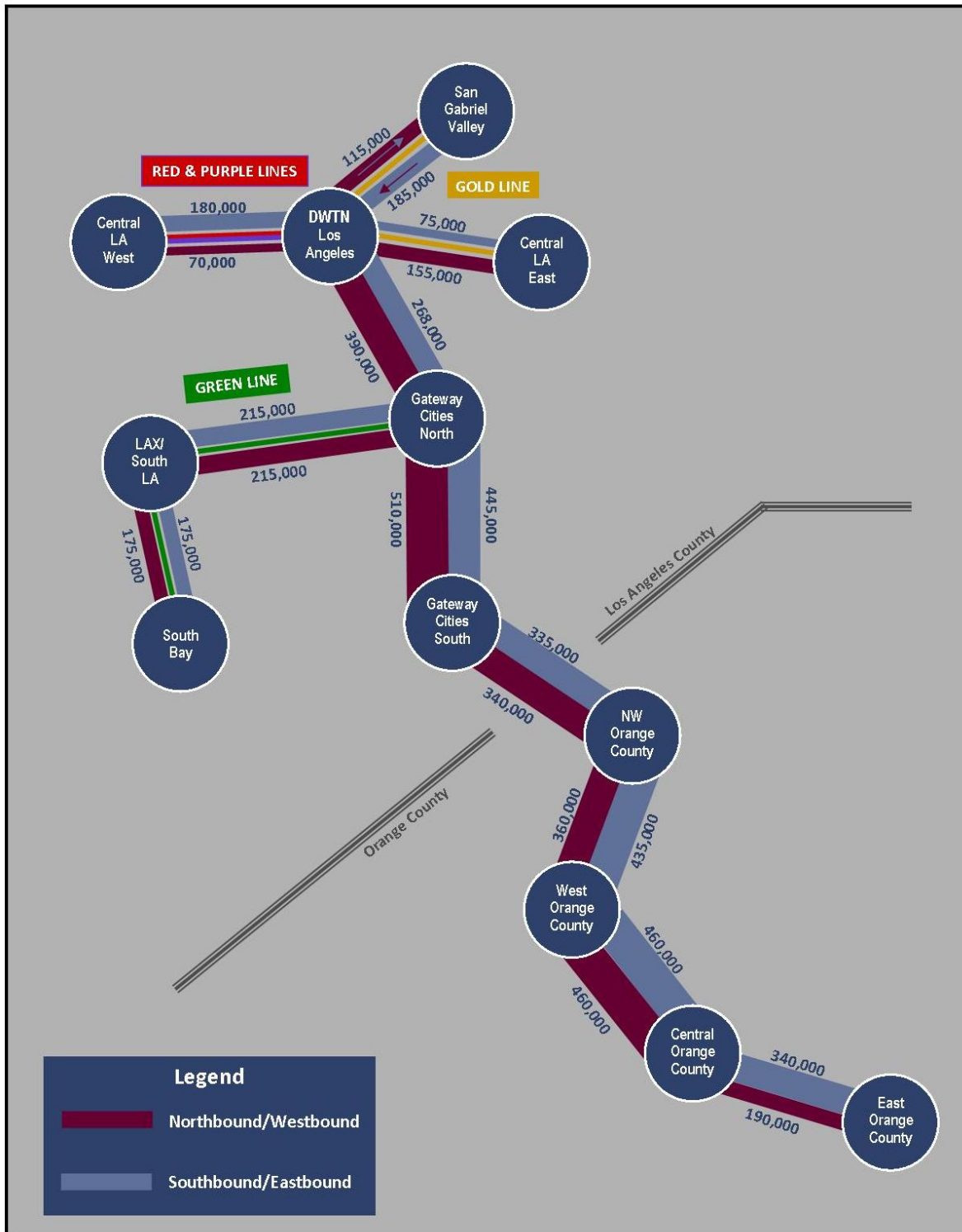
Corridor Subregions	Internal Trips		Trips to Los Angeles County Subregions		Trips to Orange County Subregions	
	Number	Percentage	Number	Percentage	Number	Percentage
Central Los Angeles East	228,500	40%	325,400	57%	17,200	3%
Central Los Angeles West	846,200	68%	382,400	31%	19,400	2%
Downtown Los Angeles	417,200	44%	512,300	53%	28,800	3%
Gateway Cities North	1,017,300	60%	523,700	31%	156,800	9%
Gateway Cities South	780,100	61%	308,700	24%	184,900	15%
Interior South Bay	366,200	52%	304,000	43%	32,600	5%
LAX/Inglewood/South Los Angeles	319,300	55%	249,100	43%	13,300	2%
San Gabriel Valley	1,213,100	76%	368,700	23%	23,100	1%
Central Orange County	592,700	59%	56,300	6%	358,600	36%
East Orange County	561,000	58%	39,100	4%	360,700	38%
Northeast Orange County	250,900	44%	36,000	6%	277,100	49%
Northwest Orange County	743,600	56%	198,700	15%	381,600	29%
West Orange County	720,900	52%	140,200	10%	526,900	38%

Source: Metro Model, 2006.

An analysis has been prepared identifying the number of trips made between corridor subregions to determine possible travel patterns supportive of a transit system investment. The results illustrated in Figure 3.2 focuses on the seven subregions through which the proposed project alignment would operate. In addition, the following analytical points should be noted:

- **Downtown Los Angeles** includes corridor generated trips destined for Central Los Angeles East and West and the San Gabriel Valley, as riders traveling to Downtown would be able to transfer to the Metro Gold Line to travel to Central Los Angeles East and portions of the San Gabriel Valley, and the Metro Red and Purple lines to Central Los Angeles West; and

Figure 3.2 – Corridor Study Area Travel Patterns (2035)



- **Gateway Cities North** includes travel to the Interior South Bay and LAX/South Los Angeles subregions that would be accessed via a transfer to the Metro Green Line.

By 2035, the corridor will experience a high level of daily travel along the proposed system alignment. Order of magnitude daily travel numbers between the alignment's subregions were identified and are presented in Table 3.5 and Figure 3.2. The future travel volumes are identified as northbound (towards Downtown Los Angeles) and southbound (to Santa Ana), and totaled to identify the magnitude of the future travel along the corridor. A low end of possible transit ridership was defined based on the five percent transit share currently experienced in the PEROW/WSAB Area. The study area north of the I-105/Metro Green Line has a 15 percent transit share, which would yield significantly higher ridership numbers. The conceptual evaluation shows that there is a strong possible transit market when compared to currently operating Metro urban rail lines.

Table 3.5 – Corridor Daily Travel Volumes (2035)

	Downtown LA to Gateway Cities North	Gateway Cities North to Gateway Cities South	Gateway Cities South to Northwest Orange County	Northwest Orange County to West Orange County	West Orange County to Central Orange County	Central Orange County to East Orange County
Northbound Travel	285,000	445,000	335,000	360,000	460,000	340,000
Southbound Travel	390,000	510,000	340,000	435,000	430,000	190,000
Total Travel	675,000	955,000	675,000	795,000	890,000	530,000
Possible Transit Share (5%)	33,750	47,750	33,750	39,750	44,500	26,500

Source: Metro Model, 2006.

In addition, Figure 3.2 illustrates the strong travel markets to and from the corridor subregions along the proposed PEROW/WSAB alignment to the following destinations accessible by the Metro rail system:

- **Central Los Angeles East** via the East Los Angeles Gold Line with 11,250 additional daily riders;
- **Central Los Angeles West** via the Red and Purple Lines with 12,500 new daily riders;
- **San Gabriel Valley** via the Pasadena Gold Line with 15,000 possible daily riders;
- **LAX/Inglewood/South Los Angeles** via the Green Line and future Crenshaw Line with 21,500 additional riders; and
- **Interior South Bay** via Green Line providing 17,500 possible new riders.

3.4 Summary of Travel Demand

In summary, there is strong travel demand in the Corridor Study Area that would support implementation of a high-capacity transportation system investment as demonstrated by the following:

1. **The Corridor Study Area has a diverse set of activity centers and destinations that result in a diverse set of trip types.** Study area destinations attract local and regional travel needs, including residents and local and regional visitors. While study area travel has a high percentage

of work-related trips, the wide range of destinations would result in a significant number of non-work trips, including entertainment, cultural, and recreational travel. As demonstrated by other cities, such as San Diego and Portland, a diverse set of trip types would widen and strengthen the viability and utilization of a transportation system investment.

2. **There is a significant future increase in travel activity.** By 2035, total daily travel originating and remaining in the Corridor Study Area will increase by 18 percent or 2.6 million new daily trips. Even with implementation of the planned and funded highway improvements, the corridor's freeway and arterial system will experience worsening operations. Implementation of a high-capacity transit system could accommodate a portion of the future travel demand, and reduce future impacts on the corridor's congested highway system.
3. **There is a high level of daily travel** both internal to and between the corridor's subregions that would support a high-capacity transit investment. The conceptual evaluation of possible ridership shows a strong transit market when compared to currently operating Metro urban rail lines. When assessed at the low end of possible ridership (five percent), similar to the current mode share in the southern portion of the corridor, ridership could range between 26,500 and 47,750 daily passengers.
4. **Development of a transit system in this corridor would feed and enhance use of the existing and future Metro rail system.** A significant regional investment has been made in building an extensive urban rail system in Los Angeles County. Conceptual analysis shows that travel to and from the corridor would provide additional passengers for Metro's rail system.

4.0 REGIONAL TRANSPORTATION SYSTEM

This section describes the current transportation system in the PEROW/WSAB Corridor Study Area, and provides an overview of the existing freeway and arterial system and transit services, along with an overview of future highway and transit programs and projects.

Currently, travel in the study area is heavily automobile-oriented with some transit usage. The study area is served by an extensive freeway and arterial system, with transit access provided primarily by bus and circulator service, and some rail service. More than 90 percent of work-related trips are made by automobile whether in a single-occupant vehicle (SOV) or carpool. Today, users of the freeway and arterial system experience severe congestion during peak periods. Although almost every major arterial street has a bus service, buses must operate on the congested arterial system. Residents have limited access to the regional and Metro rail system. Although major highway system improvements are planned to improve flow and travel speeds, minor investments are proposed for the study area's bus transit service, and no improvements are currently proposed for rail service improvements.

4.1 Regional and Local Highway System

As presented in Figure 4.1, there are seven freeways within or framing the boundaries of the Corridor Study Area:

- ***I-5/Santa Ana Freeway*** – This freeway runs at a northwest-southeast diagonal parallel to and north of the PEROW/WSAB ROW, and forms a majority of the eastern study area boundary. The I-5 is a heavily traveled interstate highway that connects Los Angeles and Orange counties north to the Central Valley and Sacramento, and south to San Diego.
- ***I-405/San Diego Freeway*** – This freeway operates at a northwest-southeast diagonal parallel to and south of the PEROW/WSAB ROW, and forms a large portion of the southern study area boundary. The I-405 is a heavily traveled highway that serves Los Angeles and Orange counties, and joins the I-5 to the north in the San Fernando Valley, and to the south to the City of Irvine.
- ***I-710/Long Beach Freeway*** – This north-south freeway runs through the western portion of the study area. The I-710 is a heavily traveled highway that connects Long Beach and the ports of Long Beach and Los Angeles north to its current terminus in Alhambra in the San Gabriel Valley.
- ***I-605/San Gabriel Freeway*** – This north-south freeway passes through the heart of the study area. It connects north to the I-210 in the San Gabriel Valley, and south to the I-405 at the boundary between Los Angeles and Orange counties.
- ***I-105/Glenn Anderson or Century Freeway*** – This east-west freeway connects the I-605 in Norwalk west to the I-405 in the LAX area. The Metro Green Line operates in the median of this freeway from Norwalk to the LAX area.
- ***SR-22/Garden Grove Freeway*** – This east-west freeway operates through the southern portion of the study area from the SR-1/Pacific Coast Highway in Long Beach to the SR-55 located in Santa Ana and Tustin.
- ***SR-91/Artesia Freeway*** – This east-west freeway operates through the heart of the study area, and connects Los Angeles, Orange, Riverside, and San Bernardino counties from the I-110/Harbor Freeway in the South Bay Cities to Downtown San Bernardino.

In addition, there are three freeways, all north-south, adjacent to the Corridor Study Area: the I-110/Harbor Freeway to the west in Los Angeles County, and the SR-55/Costa Mesa and SR-57/Orange freeways in Orange County. In the northern portion of the Corridor Study Area, Downtown Los Angeles is served by five freeways: the I-5/Santa Ana, the I-10/Santa Monica, I-110/Harbor, SR-60/Pomona, and US-101.

The Corridor Study Area is well-served by a major and secondary arterial street system that is laid out in a regular grid pattern throughout Los Angeles and Orange counties. Located in a flat portion of the region, the study area's arterial grid pattern is interrupted only by rivers and flood channels. Key north-south and east-west major arterials that serve longer trips, starting from the northern portion of the study area, are listed in Table 4.1.

Table 4.1 – Major Arterials in Corridor Study Area

North-South		East-West	
Street	County	Street	County
Avalon Boulevard/San Pedro Street	Los Angeles	Sixth Street/Whittier Boulevard	Los Angeles
Alameda Street	Los Angeles	Olympic Boulevard	Los Angeles
Long Beach Boulevard	Los Angeles	Washington Boulevard	Los Angeles
Atlantic Avenue	Los Angeles	Slauson Avenue	Los Angeles
Lakewood Boulevard	Los Angeles	Manchester/Firestone Boulevards	Los Angeles
Los Alamitos Boulevard	Orange	Imperial Highway	Los Angeles
Valley View Street	Orange	Rosecrans Avenue	Los Angeles
Beach Boulevard (SR-19)	Orange	Artesia Boulevard/ Orangethorpe Avenue	Los Angeles/ Orange
Brookhurst Street	Orange	Carson Street/Lincoln Avenue	Los Angeles/ Orange
Harbor Boulevard	Orange	Willow Street/Katella Avenue	Los Angeles/ Orange
Bristol Street	Orange	17 th Street Bolsa Avenue/1 st Street Warner Avenue	Orange Orange Orange

Figure 4.1 – Current Regional Highway System



4.2 Regional and Local Transit Systems

Currently, transit service within the Corridor Study Area is provided by bus and circulator service, with some rail system access. Regional Metrolink and Amtrak rail service operates along an alignment to the north of the Corridor Study Area boundaries, as shown in Figure 4.2. Metrolink provides commuter access throughout a five-county service area, and Amtrak operates intercity service from San Luis Obispo to San Diego, as well as a few long-distance trains. Both systems are accessible to Corridor Study Area residents only from Union Station at the northern terminus of the study area, and the SARTC at the southern terminus.

Metro provides LRT service on two lines that operate through portions of the Corridor Study Area:

- **Metro Green Line** – This LRT line operates predominantly east-west in the median of the I-105 Freeway through the northern portion of the study area. This line runs between Redondo Beach and Norwalk, and provides connections to Downtown Los Angeles and Long Beach by way of the Metro Blue Line. Study area Metro Green Line stations are located at the Norwalk Transit Center, Lakewood Boulevard in Downey, and Long Beach Boulevard in Lynwood.
- **Metro Blue Line** – This north-south LRT line forms the approximate western study area boundary, and operates between Downtown Long Beach and 7th Street/Metro Center in Downtown Los Angeles. The study area contains nine Metro Blue Line stations: two located in Compton, and seven in Los Angeles. One of the stations – Imperial/Wilmington – provides a transfer to the Metro Green Line.

Within the Corridor Study Area, bus transit service is provided by Metro, OCTA (as shown in Figures 4.3 and 4.4), and various Los Angeles County municipal operators including, Long Beach Transit, Norwalk Transit, and Montebello Transit. City-based circulator service is provided by Bellflower Bus, Bell Gardens Transit, Cerritos Transit (Cerritos on Wheels), Downey LINK, Lynwood Trolley, and Paramount Easy Rider.

4.2.1 Bicycle Connections

Bicycling is becoming an increasingly popular mode of travel throughout Southern California. Regional, county, and local policy and planning documents seek to increase the number of bicyclists who ride for commuting and other daily purposes helping to reduce traffic congestion and improve air quality. Bicyclists are encouraged on OCTA's bus system and Metro's bus and rail systems. Both Los Angeles and Orange counties have adopted bike plans, and corridor bikeways are presented in Figure 4.5 and Table 4.2 starting at the north end of the study area. Bikeways are classified as follows:

- **Class I Bike Paths** – Off-road, two-way paths most often located along flood control channels, riverbanks, active or inactive rail ROWs, and utility ROWs.
- **Class II On-Street Bike Lanes** – Striped, one-way lanes on streets or highways with posted signage.
- **Class III Bike Routes** – Bicycles operate in space shared with vehicles; typically designated by signage only.

Figure 4.2 – Existing Regional Transit Service

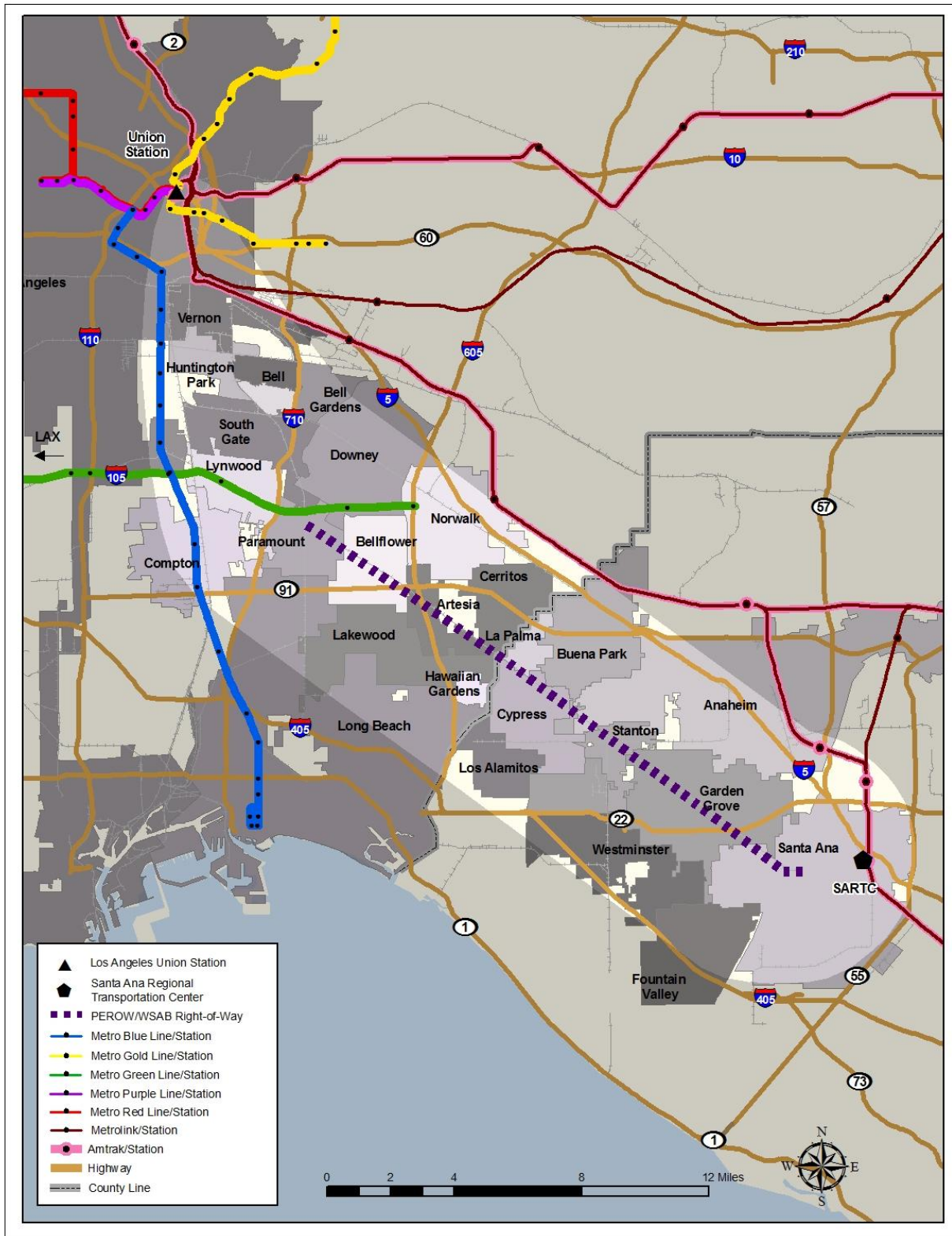


Figure 4.3 – Existing Los Angeles County Transit Service

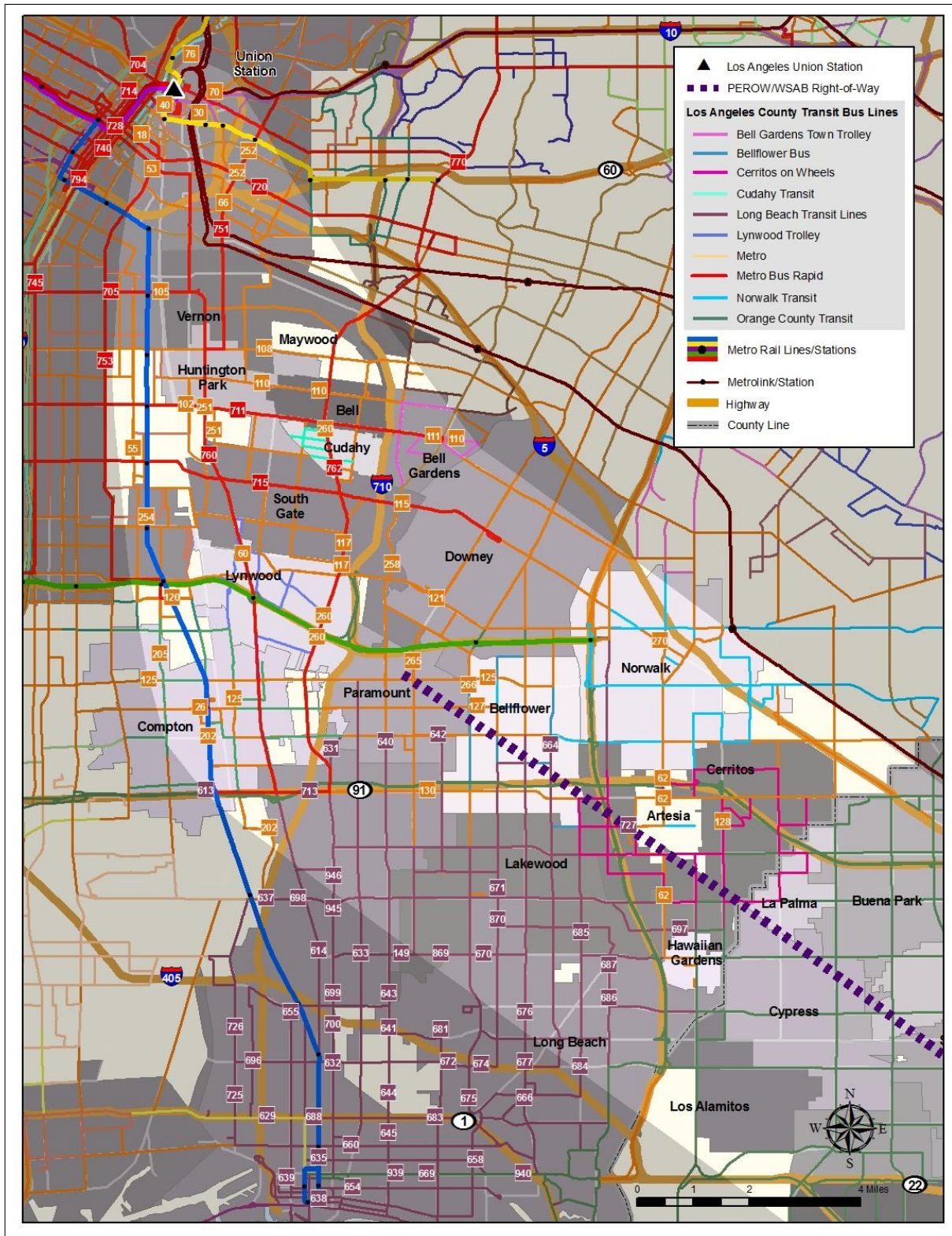


Figure 4.4 – Existing Orange County Transit Service

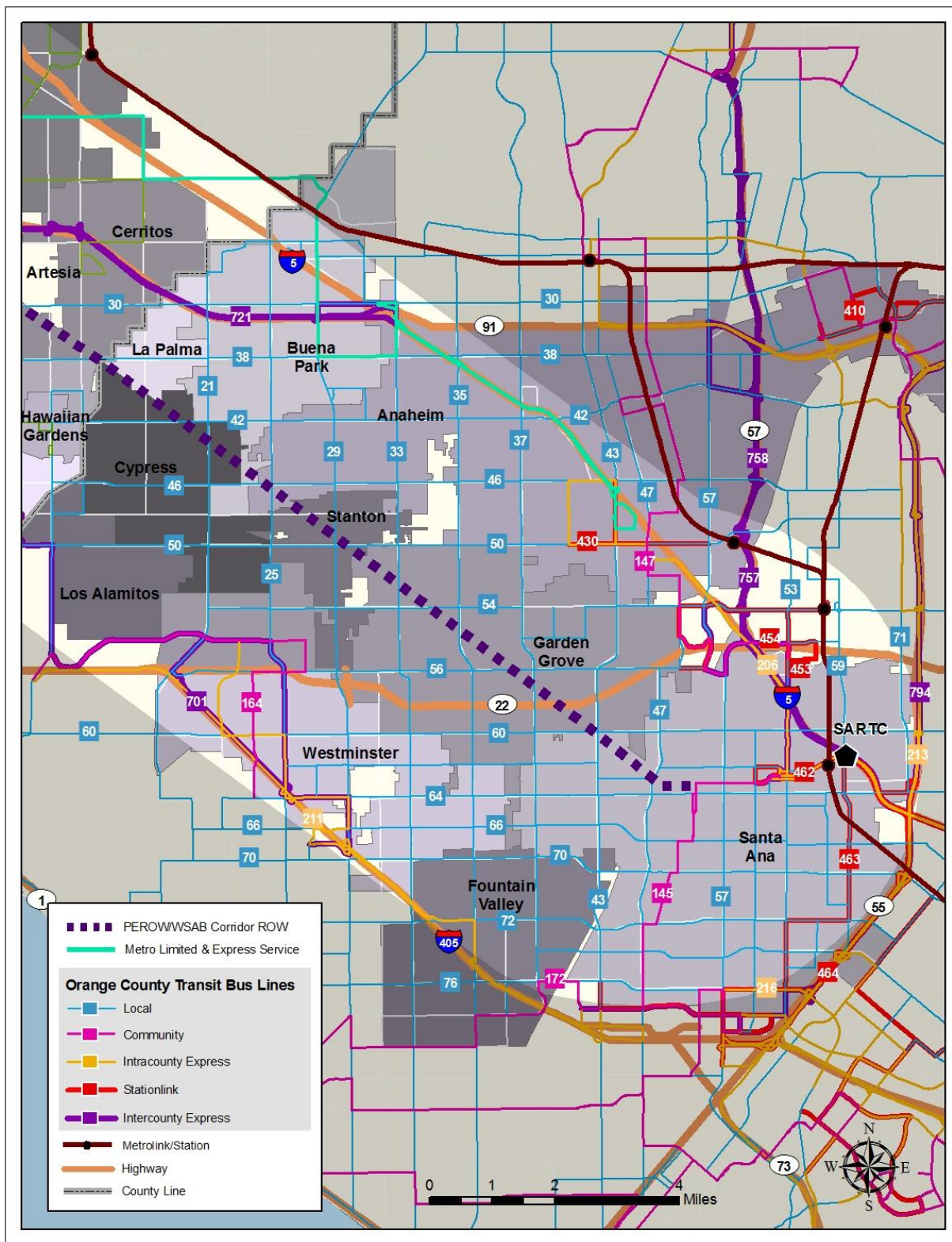


Figure 4.5 – Existing Bikeways in Corridor Study Area

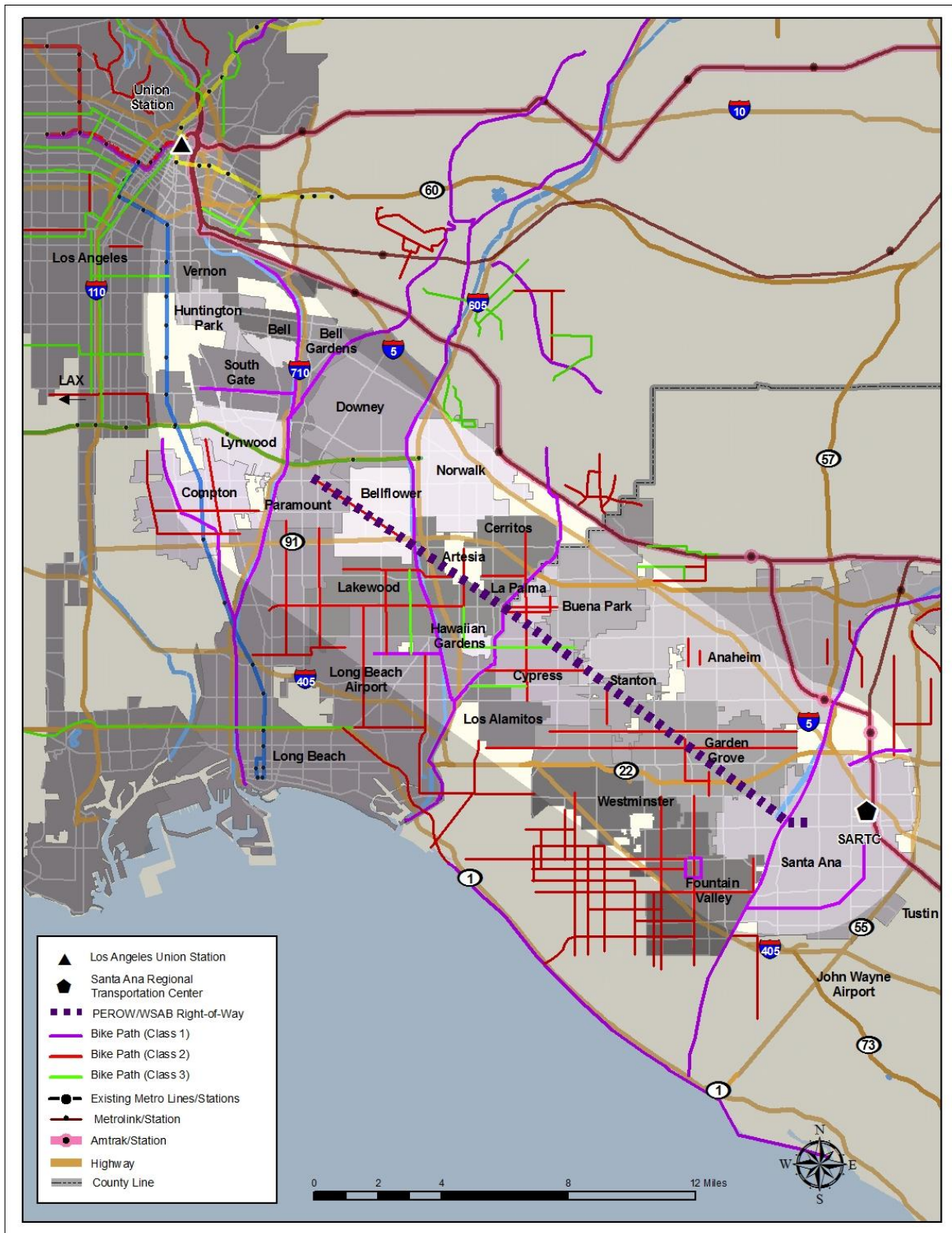


Table 4.2 – Corridor Study Area Bikeways

Bikeway	City	County
Class I Bike Paths		
Los Angeles River	Maywood/Bell/South Gate/Cudahy/Paramount	Los Angeles
San Gabriel River	Los Alamitos/Bellflower/Lakewood/Downey/Norwalk	Los Angeles
Coyote Creek	Cerritos/La Palma/Cypress/Los Alamitos	Los Angeles
Rio Hondo	Downey/Bell Gardens	Los Angeles
Southern Avenue	South Gate	Los Angeles
Carson Street	Los Alamitos	Los Angeles
Class II Bike Paths		
Del Amo Blvd.	Lakewood	Los Angeles
Woodruff Avenue	Lakewood	Los Angeles
Clark Avenue	Lakewood	Los Angeles
South St. /Carmenita Rd.	Cerritos	Los Angeles
Paramount Blvd.	Lakewood/Long Beach	Los Angeles
Orange Avenue	Paramount/Long Beach	Los Angeles
Studebaker Road	Long Beach	Los Angeles
Bellflower Blvd.	Long Beach	Los Angeles
Santa Fe Avenue	Lynwood/Compton	Los Angeles
Alondra Blvd.	Compton	Los Angeles
Martin Luther King Blvd.	Los Angeles	Los Angeles
La Palma Avenue	Cerritos/La Palma/Lakewood	Orange
Crescent Avenue	La Palma/Cypress	Orange
Moody Street	Cypress/La Palma	Orange
Holder Street	Cypress/Buena Park	Orange
Orangewood Avenue	Garden Grove	Orange
Magnolia Street	Garden Grove	Orange
Brookhurst Street	Garden Grove	Orange
Lampson Avenue	Garden Grove	Orange
Trask Avenue	Garden Grove	Orange
Newhope Street	Garden Grove	Orange
Class III Bike Routes		
Centralia Street	Artesia	Los Angeles
Pioneer Blvd.	Artesia	Los Angeles
Palo Verde Avenue	Lakewood	Los Angeles
Rose Street	Bellflower	Los Angeles
Clark Avenue	Long Beach	Los Angeles
Conant Street	Long Beach	Los Angeles
79 th Street	Los Angeles	Los Angeles
76 th Street	Los Angeles	Los Angeles
51 st Street	Los Angeles (Florence Area)	Los Angeles
Orange Avenue	Cypress	Orange

4.3 Transportation Plans

This densely populated corridor faces significant mobility challenges today and in the future with the forecasted growth in travel demand due to population and employment growth. The freeway and arterial systems operate near or at capacity during peak periods, and have had few physical improvements in recent years in portions of the study area. These congested conditions are forecasted to worsen between now and 2035. Planned and funded transportation improvements are primarily highway-based, with minor investments planned for the study area's bus and rail service.

For the Corridor Study Area, county-level transportation project planning and implementation decisions are developed by Metro and OCTA based on adopted L RTPs, which are then incorporated into the RTP and RTIP prepared by SCAG. The following discussion (illustrated in Figure 4.6) reviews Corridor Study Area highway and transit planning efforts.

4.3.1 Regional Highway System Plans

Three current highway studies and projects in or adjacent to the Corridor Study Area may impact future freeway and arterial operations:

- **Interstate 710 South EIR/EIS** – The I-710 South Environmental Impact Report/Environmental Impact Study (EIR/EIS) is evaluating how to better serve this vital travel route, while reducing congestion and related environmental impacts on communities along the freeway. The alternatives being considered include the addition of four truck lanes and ten general travel lanes from the ports north to the SR-60 in the San Gabriel Valley.
- **Interstate 405 Studies and Plans** – Widening the I-405 between the SR-73 and I-605 has been the subject of several OCTA and California Department of Transportation (Caltrans) studies. OCTA led a Major Investment Study (MIS) to evaluate proposed improvements to increase capacity, improve interchange operations, and enhance road safety. In 2005, two alternatives were adopted by the OCTA Board for further study: No Build and a Build Alternative comprised of adding two mixed-flow lanes in each direction. Following completion of the MIS, OCTA and Caltrans prepared a Progress Study Report in 2008, which recommended that the two alternatives be carried forward into the environmental review phase. Caltrans, in cooperation with OCTA, initiated preparation of an EIR/EIS in 2008. The draft EIR/EIS is planned for completion in late 2011, with the final document slated for delivery in mid-2012. The Record of Decision/Notice of Determination is anticipated in late 2012.
- **Interstate 5 Studies and Plans** – Since the passage of Measure M in 1990, Orange County has been widening and improving this freeway from its junction with the I-405 to the Los Angeles County border. There are currently two construction efforts and one planning study underway:
 1. **Santa Ana Freeway (I-5) Gateway Project** – This project widened the remaining two miles of the I-5 Freeway in Orange County between the SR-91 and the Los Angeles County line. Completed in the fall of 2010, the project included new travel and high-occupancy vehicle (HOV) lanes, overpasses/underpasses at selected locations, and related improvements.
 2. **I-5 Widening and HOV Project** – This fully funded project is an extension of the Santa Ana Freeway Gateway Project north into Los Angeles County between the Orange/Los Angeles County line and the I-605. Planned improvements along the 6.7-mile segment include the

provision of new mixed-flow and HOV lanes, and construction or reconstruction of overpasses/underpasses and interchanges at selected locations. This project is approximately 50 percent designed, and construction is slated to begin in June 2011. Completion of all five segments is targeted for December 2016.

3. ***I-5 Improvements between the I-605 and I-710 Freeways*** – This project's intent is to evaluate alternatives for widening the I-5 to provide mixed-flow and HOV lanes. Currently, the study effort is in the environmental clearance phase; project design, construction cost estimates, and an implementation schedule have not been identified.

4.3.2 Regional and Local Transit System Plans

The AA study will evaluate possible connections from the PEROW/WSAB ROW north to Union Station in Downtown Los Angeles and south to the SARTC in Downtown Santa Ana, as shown in Figure 4.7. Connections north into Downtown Los Angeles may occur along portions of existing railroad tracks that are under study for future use by the California High Speed Rail System (CHST). The planned 800-mile CHST will travel from Anaheim to Downtown Los Angeles, and then north through the Central Valley to the Bay Area. Subsequent phases will include a southern extension from Anaheim to San Diego via the Inland Empire. In 2004, the California High Speed Rail Authority, together with the Federal Railroad Administration, prepared and issued a *Draft Program-Level EIR/EIS*, which was certified in 2005. Project-level environmental reviews for individual sections are currently underway. A *Preliminary Project EIR/EIS* for the Palmdale to Los Angeles sections was released in July 2010. Proposed stations along the Downtown Los Angeles to Anaheim segment include Downtown Los Angeles, Norwalk, Fullerton, and Anaheim.

Union Station and the SARTC provide connections to intra- and inter-regional rail service provided by Metrolink and Amtrak. Part of the project resulting from this AA study may use a portion of the railroad tracks currently used by Metrolink and Amtrak service. Service improvement studies for these rail services include:

- **California Passenger Rail System 20-Year Improvement Plan** (2001), which provided a comprehensive blueprint for improving service on the system's existing rail corridors, including the Pacific Surfliner Amtrak service that operates along the rail corridor, shared with Metrolink and freight operations, to the north of the Corridor Study Area.
- **LOSSAN Strategic Plans** developed for the Los Angeles-San Diego-San Louis Obispo (LOSSAN) rail corridor include a ***South Strategic Business Plan*** (2003), and a ***North Strategic Business Plan*** (2007). These plans establish a program of projects for long-term improvements to the rail corridor used by Amtrak, Metrolink, and freight traffic. Caltrans will initiate work on updating these plans in June 2011.

4.4 Future Projects

Currently planned projects in the Corridor Study Area have been identified from transportation tax measure programs approved by Los Angeles and Orange county voters, adopted Metro and OCTA LRTPs, and the SCAG RTP and RTIP. Figure 4.6 illustrates the projects anticipated to be implemented by 2035.

SCAG

The adopted 2008 RTP presents a transportation vision for the region through the year 2035, and incorporates approved transportation programs and projects with committed, available, or reasonably available revenue resources. Table 4.3 presents the major RTIP highway and transit projects located within the Corridor Study Area.

Table 4.3 – RTIP Transportation Improvements in Corridor Study Area

Project Name	Project Description/Limits
Highway Improvements	
I-5	Orange County Line to I-605 – construct HOV and mixed-flow lanes
	Carmenita Interchange – improve interchange
	I-605 to I-710 – Study widening of freeway to provide HOV and mixed-flow lanes
	Route 39 (Beach Blvd) to I-710 – add one lane in each direction
	SR-55 to SR-57 – add one HOV lane and one mixed flow lane in each direction
	SR-55 – reconfigure interchange
	Bolsa Avenue – widen bridge from four to six lanes
I-405	Beach Boulevard – provide Interchange improvements
	SR-73 to Los Angeles County Line – construct one all-purpose lane in each direction and provide other improvements
	Provide HOV connectors – to/from I-405/I-605, to/from I-405/SR-22, and on I-405 between I-605 and SR-22
	Bolsa Avenue – widen bridge from four to six lanes
I-605	Katella On Ramp – improve interchange
I-710	As part of I-710 Corridor Program (widening to provide 4 truck lanes and 10 general lanes) – provide interchange improvements at I-405, SR-91, and I-105
	Magnolia – replace interchanges, construct HOV lanes, and lengthen bridges
SR-55	I-405 to SR-22 – add one mixed flow lane in each direction and fix chokepoints
SR-91	SR-57 to I-5 – tie existing auxiliary lanes together to form a fourth mixed flow lane

Table 4.3 – RTIP Transportation Improvements in Corridor Study Area

Project Name	Project Description/Limits
Arterial Improvements	
Los Angeles County	\$1.5 billion
Orange County	\$2.0 billion
Transit Projects	
Regional Connector	Downtown Los Angeles LRT connection between Union Station and 7 th /Metro Center
Long Beach Transit	Increase service frequency on bus routes connecting Long Beach with Orange County
TDM Projects	
WSAB Right-of-way	Construct Class 1 Bikeway

Metro

Adopted by the Metro Board in October 2009, the 2009 LRTP serves as the primary transportation planning tool to guide transportation investments through 2040. The 2009 LRTP incorporates projects from the Measure R transportation sales tax program approved by voters in November 2008. The resulting LRTP is a financially constrained plan of projects that can be implemented based on reasonable future revenue assumptions. Table 4.4 lists the Metro LRTP projects in the study area.

Table 4.4 – Metro LRTP Projects in Corridor Study Area

Project Name	Project Description/Limits
Highway Improvements	
I-5	I-605 to Orange County Line – construct one carpool and one mixed-flow lane in each direction
	Carmenita Road Interchange – construct new ten lane bridge with six through lanes and two left turn pockets in each direction
	I-605 to SR-60 – Add one HOV lane in each direction
	I-5/I-605 – add partial HOV connector
I-605	“Hot Spot” Interchanges – improve interchanges, such as at the SR-60, I-5, SR-91, and I-405 Interchanges
	I-605/SR-91 – provide HOV connector
	I-605/I-105 – provide HOV connector
I-710	Ports of Long Beach and Los Angeles/SR-60 – provide ten general purpose lanes and four truck lanes
	Atlantic/Bandini – provide interchange improvements
I-710 South and/or Early Action Projects	Upgrade freeway and improve truck and traffic flows between Ports of Long Beach and Los Angeles and SR-60 Freeway, improve arterials

Figure 4.6 – Funded Highway System Improvements (2035)



Table 4.4 – Metro LRTP Projects in Corridor Study Area

Project Name	Project Description/Limits
Highway Improvements	
Burlington Northern Santa Fe Grade Separations	Gateway Cities – construct rail and roadway grade separations at five locations
SR-91	Reconfigure Lakewood Boulevard Interchange
Transit Projects	
Regional Connector	LRT project linking Union Station and 7 th /Metro Center Station
West Santa Ana Branch Corridor	Phase I grade-separated transit project from Los Angeles County Line toward Downtown Los Angeles

OCTA

The OCTA is the state-designated transportation planning and programming agency for Orange County. During preparation of the 2006 LRTP, alternative plans were developed reflecting varying levels of transportation investment, including a Balanced Plan based on voter-approval of an extension of Measure M. In November 2006, Orange County voters approved a 30-year extension of Measure M, which will provide \$11.6 billion for future transportation programs. Table 4.5 presents the projects included in the Measure M2 Program and the Balanced Plan of the 2006 LRTP.

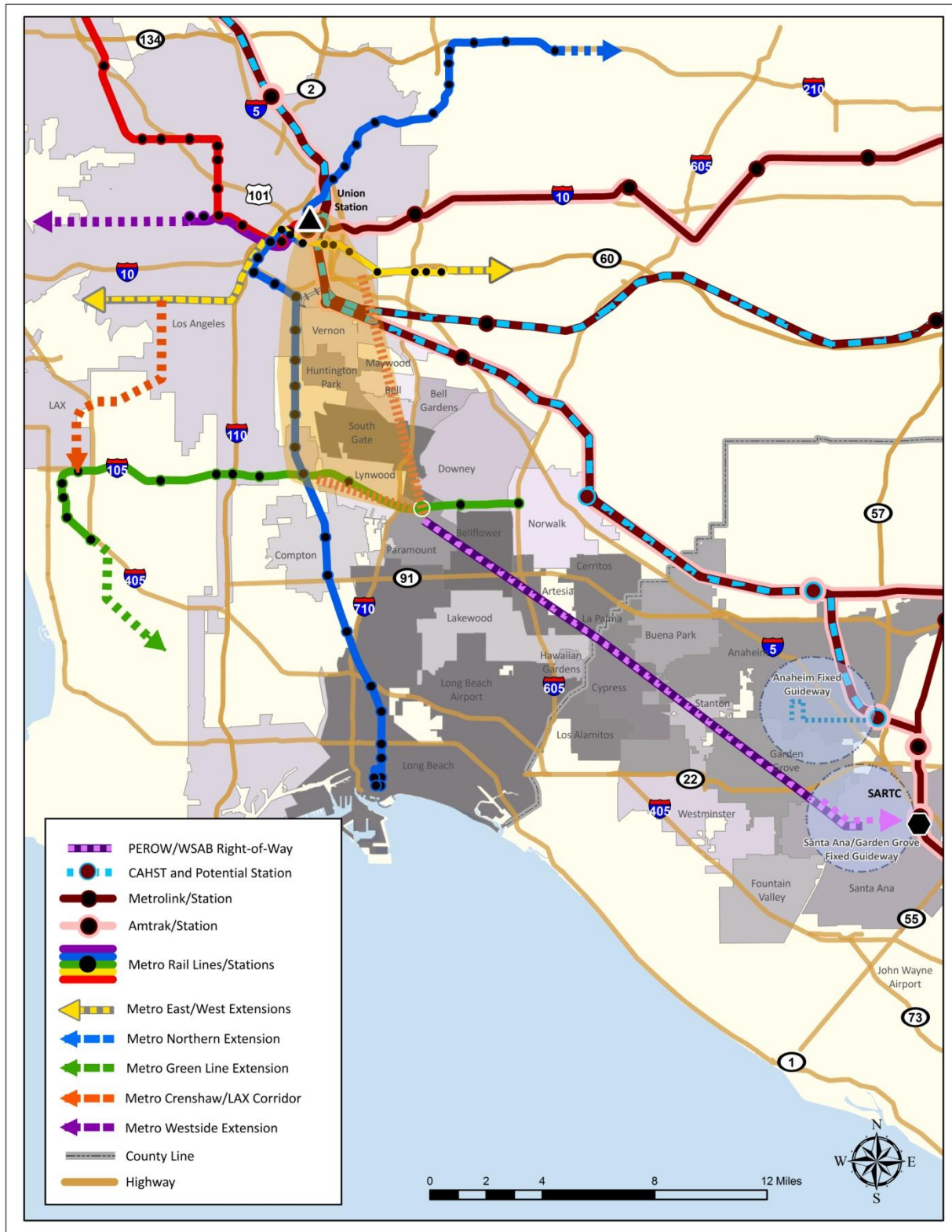
Table 4.5 – OCTA LRTP and Measure M2 Projects in Corridor Study Area

Project Name	Project Description/Limits
Highway Improvements	
I-5	SR-55 to SR-57 – improvements
	Local interchange improvements
	Rte 39 (Beach Blvd) to I-710 – add one lane in each direction
	SR-55 to SR-57 – add one HOV lane and one mixed flow lane in each direction
	I-5/SR-55 – reconfigure interchange
I-405	I-605 to SR-73 – construct one all-purpose travel lane in each direction plus additional improvements
	Provide HOV connectors – to/from I-405/I-605, to/from I-405/SR-22, and on I-405 between I-605 and SR-22
	Beach Boulevard – provide Interchange improvements
	Bolsa Avenue – widen bridge from four to six lanes
I-605	Los Alamitos – provide freeway access improvements
	I-605/Katella – improve interchange
SR-22	Magnolia Street – replace interchanges, construct HOV lanes, and lengthen bridges
	Interchange improvements at Brookhurst Street, Euclid Street, and Harbor Boulevard

Table 4.5 – OCTA LRTP and Measure M2 Projects in Corridor Study Area

Project Name		Project Description/Limits
Highway Improvements		
SR-22		Magnolia Street – replace interchanges, construct HOV lanes, and lengthen bridges
		Interchange improvements at Brookhurst Street, Euclid Street, and Harbor Boulevard
SR-55		I-405 to SR-22 – add one mixed flow lane in each direction
		SR-22 to I-405 – construct additional travel lanes
SR-57		I-5 to SR-57 – provide additional travel lanes and on/off ramp improvements
Transit		
Metrolink		Improve service including increased frequency, upgraded stations, and new parking facilities
Metrolink Community Service		Provide improved connections to Metrolink stations from the surrounding communities
Metrolink Stations		Convert key Metrolink stations, including SARTC into Regional Gateways, to better connect with the future high-speed rail system
Bus Service		Provide improved passenger service and amenities

Figure 4.7 – Planned Future Regional Transit System (2035)



5.0 TRANSPORTATION SYSTEM PERFORMANCE

The ability to move quickly and efficiently in the Corridor Study Area can be expressed in terms of freeway and arterial congestion, along with transportation system accessibility and choice. At first glance, the Corridor Study Area appears to be well served from a transportation perspective with seven freeways in or near the study area, an extensive arterial street system, bus transit service provided by five operators, and city-based circulator services operated by six cities. This densely populated corridor faces significant transportation challenges, however. Currently, a majority of the area's freeway and arterial system experiences severe congestion and operates near or at capacity during the morning and evening peak periods. Even with the planned highway system improvements, study area travelers are projected to experience continuing and worsening freeway and arterial congestion through 2035.

Corridor Study Area residents will continue to have limited travel options – private automobile or bus transit – both using the same congested highway system. Minor investments planned for the area's bus transit service may improve mobility, but only in limited portions of the study area. One connection to the Los Angeles County rail system exists through the east-west running Metro Green Line. This LRT line operates in the northern portion of the study area, but this route does not serve the corridor's primarily north-south travel patterns. Metrolink and Amtrak rail service is available only at the northernmost and southernmost ends of the study area. With the forecast population and employment growth, the lack of investment in the area's transit infrastructure will limit mobility and transportation choices, adversely affecting future corridor travel and economic vitality.

5.1 Highway System Performance

The Los Angeles-Santa Ana metropolitan area contains the most congested roadways in the country according to the Texas Transportation Institute's *2009 Urban Mobility Report*. Freeways and arterials in the Corridor Study Area are no exception, and often lead the list of the region's most congested facilities. For example, the I-5 and I-405 freeways experience high traffic volumes not only during peak commute periods, but throughout the day.

Between now and 2035, these congested conditions are forecast to worsen. Six of the study area's seven freeways are projected to operate at level of service (LOS) E or F along 80 to 100 percent of the study area's lane miles during the evening peak period, and five will be severely congested (LOS E or F) during the morning peak period, as well. Currently, major study area arterials experience high peak traffic volumes resulting in significant congestion during both peak periods. With the forecast increase in population and employment, arterial congestion is projected to increase to 90 to 100 percent of capacity on key routes, with many arterials projected to decline to LOS F by 2035.

5.1.1. Freeway System

The ability of the Corridor Study Area's freeway system to serve current and future travel demand is significantly limited by congestion. The Metro Travel Demand Model was used to evaluate current and future freeway levels of service within the Corridor Study Area. LOS estimates are used to assess the performance of the study area's freeway and roadway system, where LOS is defined as the roadway's volume compared with its carrying capacity as shown in Table 5.1. Roadways at LOS E are nearing or are at-capacity, while LOS F indicates a facility operating beyond the identified system capacity with significant delay.

Table 5.1 – Level of Service Definition

Level of Service (LOS)	Volume/Capacity	Description of Traffic Flow
A	0.000 – 0.600	Free flow
B	0.601 – 0.700	Free flow with periodic slowing
C	0.701 – 0.800	Start of congestion
D	0.801 – 0.900	Traffic volumes approaching capacity
E	0.901 – 1.000	System near or at capacity resulting in unstable flow
F	> 1.000	System beyond capacity with stop and go traffic

Table 5.2 presents the Corridor Study Area freeways operating at an LOS of E or F based on 2006 and 2035 information from the Metro model (Figures 5.1 and 5.2). Study area freeways operating totally at LOS F are indicated in bold. The percentage shown represents the length of each freeway within the study area operating near, at or beyond capacity.

Table 5.2 – Corridor Study Area Freeways with Level of Service E or F

Freeways		AM Peak Period		PM Peak Period	
		2006	2035	2006	2035
I-5	NB	45-50%	95-100%	45-50%	95-100%
	SB	40-45%	90-95%	40-45%	95-100%
I-405	NB	90%	90-95%	90%	90-95%
	SB	90%	95-100%	90%	95-100%
I-710	NB	5%	5-10%	--	5-10%
	SB	--	10-15%	5%	10-15%
I-605	NB	75%	80-85%	80-85%	80-85%
	SB	50-55%	80-85%	80-85%	80-85%
I-105	EB	40-45%	65-70%	90-95%	95-100%
	WB	90%	95-100%	50-55%	95-100%
SR-22	EB	15-20%	75-80%	15-20%	85-90%
	WB	15-20%	75-80%	15-20%	85-90%
SR-91	EB	50-55%	85-90%	90%	85-90%
	WB	90%	90-95%	80-85%	90-95%

Source: Metro Model, 2006. **Bold** numbers indicates LOS F only.

In 2006, all of the Corridor Study Area freeways experienced LOS E or F along a portion of their alignments during the morning (7:00-9:00 AM) and evening (4:00-6:00 PM) peak periods, except the I-710. During the morning peak period, the highest levels of congestion occurred in both directions on the I-405, and westbound on the I-105 and SR-91. In the evening, the I-405 operated with severe congestion in both directions, as did the I-605 and SR-91. The eastbound I-105 had significant delay in the evening peak period as LAX/El Segundo-area employees returned home.

In 2035, all of the study area's freeways are forecasted to experience a significant increase in congestion, with related growth in delays and travel times. During the morning peak period, all of the freeways will operate at LOS E or F along 75 percent or more of their study area length, except for the

Figure 5.1 – Freeway Level of Service (2006)

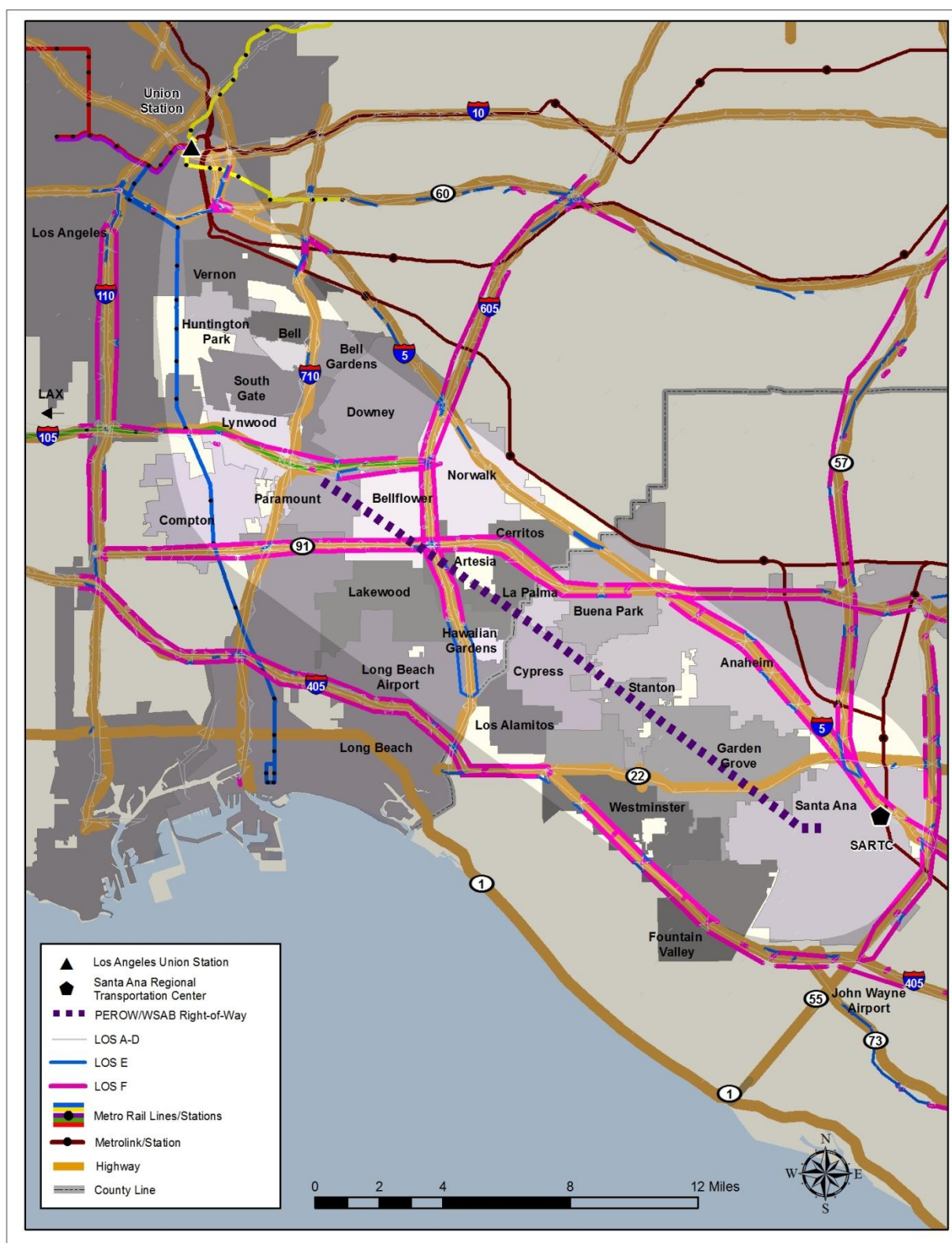
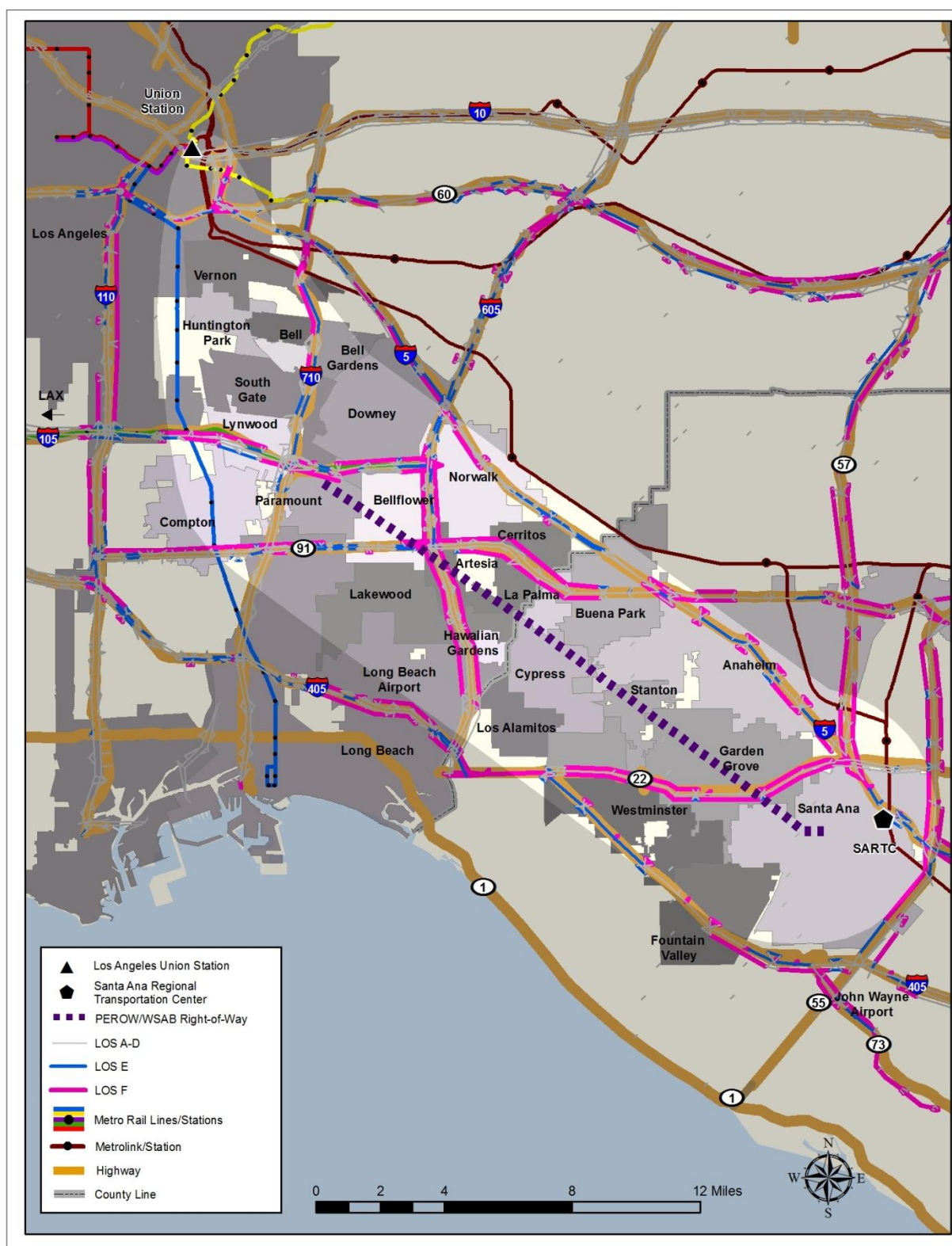


Figure 5.2 – Freeway Level of Service (2035)



eastbound I-105 and the I-710. Evening congestion will be even worse, with all of the study area freeways, except for the I-710, operating at LOS E or F along 80 percent or more of their length. The following provides a Corridor Study Area freeway-specific discussion of current and forecast operations:

- **I-5 Freeway** – In 2006, the I-5 experienced LOS E or F operations along 40 to 50 percent of its length during the morning and evening peak periods. In 2035, freeway segments with congestion will double, with 90 to 100 percent of the I-5 within the study area experiencing LOS E or F operations. In the morning, northbound travelers into Downtown Los Angeles will drive in LOS F conditions along 95 to 100 percent of the study area freeway route, and again as they return home.
- **I-405 Freeway** – Currently, during both peak periods, the I-405 experiences LOS F service in both the northbound and southbound directions along 90 percent of its study area length. In 2035, with the completion of planned capacity improvements, auto travel is forecasted to improve with more LOS E in both directions during the peak time periods.
- **I-710 Freeway** – During the morning and evening peak periods, the Metro model shows that the I-710 currently operates at LOS D or better, with the exception of one segment between Firestone Boulevard and Florence Avenue. In 2035, even with the planned capacity improvements providing a total of 14 lanes, travelers are forecasted to experience LOS E or F service along 5 to 15 percent of the I-710 study area length.
- **I-605 Freeway** – During the 2006 morning peak period, this freeway experienced a combination of LOS E and F operations along 75 percent of its northbound study area length, while 50-55 percent of the southbound travel along the same route experienced LOS F conditions. Operations will worsen in 2035, with 80 to 85 percent of the freeway's study area length experiencing LOS E or F operations in the northbound direction in the morning, and LOS F operations along 80 to 85 percent of its study area length in the morning southbound direction, and LOS F operations in both directions during evening travel.
- **I-105 Freeway** – In 2006, travel on the I-105 was primarily constrained in the westbound direction in the morning, and in the eastbound direction in the evening. By 2035, congestion will become more severe with forecast LOS E or F operations along 95 to 100 percent of the study area length of the freeway in both directions in the evening peak, and in the westbound direction in the morning peak.
- **SR-22 Freeway** – In 2006, the SR-22 operated at LOS F along 15 to 20 percent of its study area length in the morning peak, and experienced LOS E or F conditions along 15 to 20 percent of the study area's freeway length during the evening peak. In 2035, congestion will worsen with 75 to 90 percent of the portion of the SR-22 in the study area operating at LOS E or F during both peaks.
- **SR-91 Freeway** – In 2006, the SR-91 experienced a significant level of congestion and delay with LOS E or F operations along 90 percent of its length in the westbound direction during the morning peak. In the evening, it operated at LOS F along 90 percent of the eastbound study area portion, and LOS E or F along 80 to 85 percent of its westbound length. In 2035, this freeway is forecasted to operate at LOS F for 85 to 95 percent of its study area length in both directions during the morning and evening peaks.

5.1.2 Arterial System

Local streets and roads account for over 80 percent of the total road network in the study area and carry much of the area's traffic. Arterials often serve as freeway access routes and as alternative parallel routes to congested freeway corridors. The Corridor Study Area's arterial street system covers portions of 21 cities, all with their own street standards and plans, but with similar current and future challenges.

The Metro model was used to assess the existing and projected operating conditions on the arterial street system. As shown in Figure 5.3, in most locations the arterials adjacent to the freeways and offering access to and from the freeways, are the most congested. The analysis shows that a number of arterial routes providing freeway access are currently operating at LOS E or F, and that the resulting congestion extends from the freeways for several blocks in the morning, and one to two miles in the evening. The freeways creating a majority of the arterial impacts are the I-5, SR-22, I-710, and I-605. In addition, much of the significant arterial congestion is focused in the high-density office areas of Downtown Los Angeles and Anaheim, Santa Ana, and Orange.

In 2035, total miles traveled on the study area's arterial roadway network are expected to increase significantly, severely impacting arterial performance throughout the Corridor Study Area. As shown in Figure 5.4, there will be a corresponding increase in the number of arterial segments operating at LOS E or F during both the morning and evening peak periods. As in 2006, more arterial segments will operate at LOS E or F during the evening peak than in the morning.

During the morning peak period, arterial congestion will remain highest on streets providing access to and from the area's freeways, but the congestion will expand in distance and severity. In some cases, arterial congestion from one freeway will start to impact the arterial street congestion resulting from another freeway. For example, congestion on the north-south streets between the SR-22 and I-405 is projected to be almost continuous, and will begin to impact cross streets. During the morning peak period, approximately 25 percent of the area's streets are forecasted to operate at LOS E or F. Evening peak period projections show more than 60 percent of the study area's arterial network operating at LOS E and F. A majority of the area's arterials will be operating at LOS F.

The current levels of congestion and the forecast increase indicate the need for additional capacity either through highway improvements, or alternative travel options. In mature urban areas, there is often little right-of-way available for capacity enhancements, and operational and technological improvements are used to maximize system performance. Arterial improvement strategies include: physical solutions such as spot widening and restriping to add dedicated queuing space, and efficiency tools to improve traffic flow, such as signal timing adjustments, signal synchronization, and Intelligent Transportation Systems that allow traffic engineers to monitor traffic flow and adjust signals in real time to resolve increasing congestion resulting from heavy traffic, special events, and/or accidents. While many arterial improvement projects in Los Angeles and Orange counties are currently in planning, design, and construction, due to the forecast growth in population, employment, and related daily travel, these projects are not expected to create long-lasting mobility benefits, or substantially address the Corridor Study Area's transportation needs on their own. The forecast increase in freeway and arterial system congestion, with most systems operating beyond capacity, demonstrate the increasing need for an alternative travel modal option.

Figure 5.3 – Arterial System: Level of Service (2006)

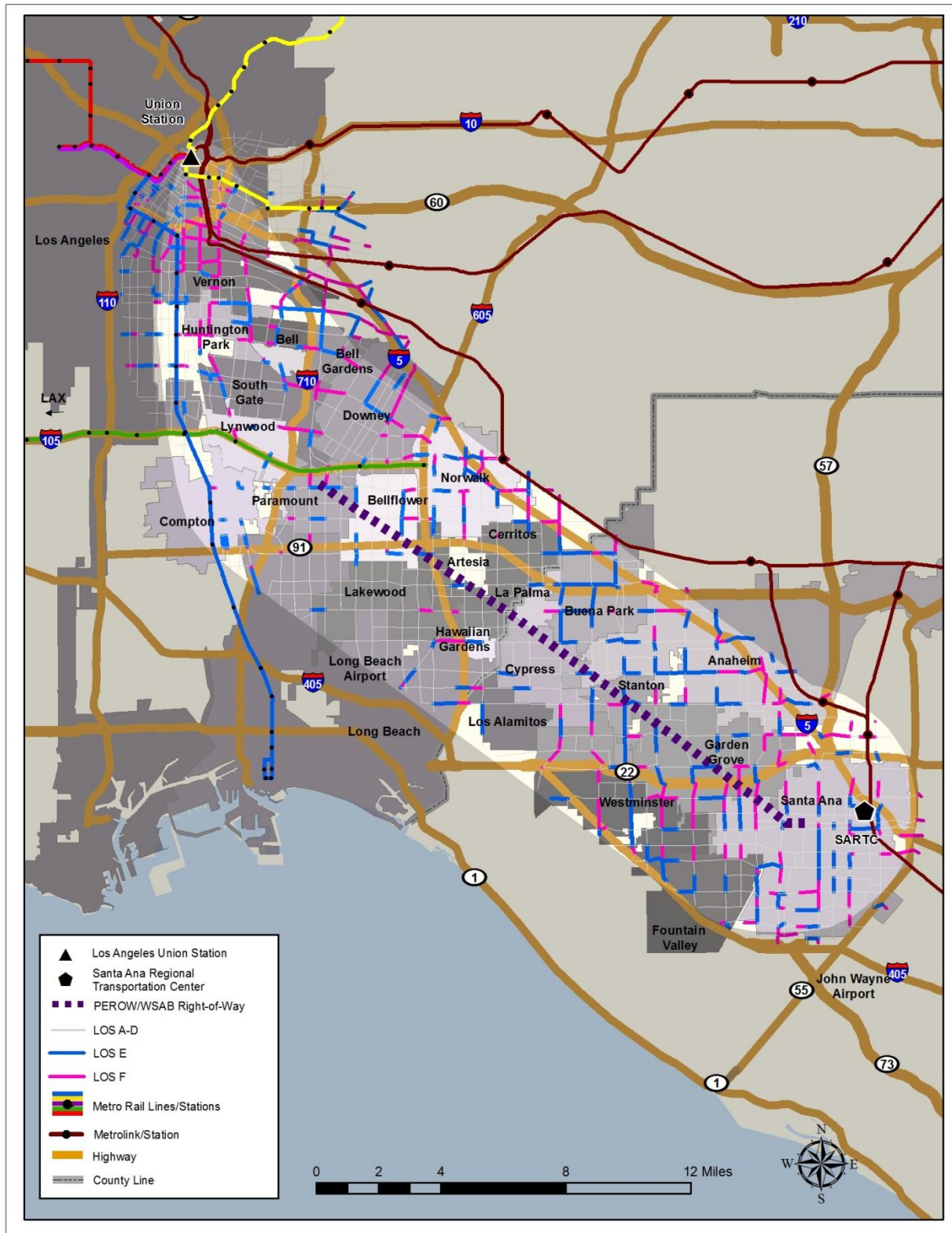
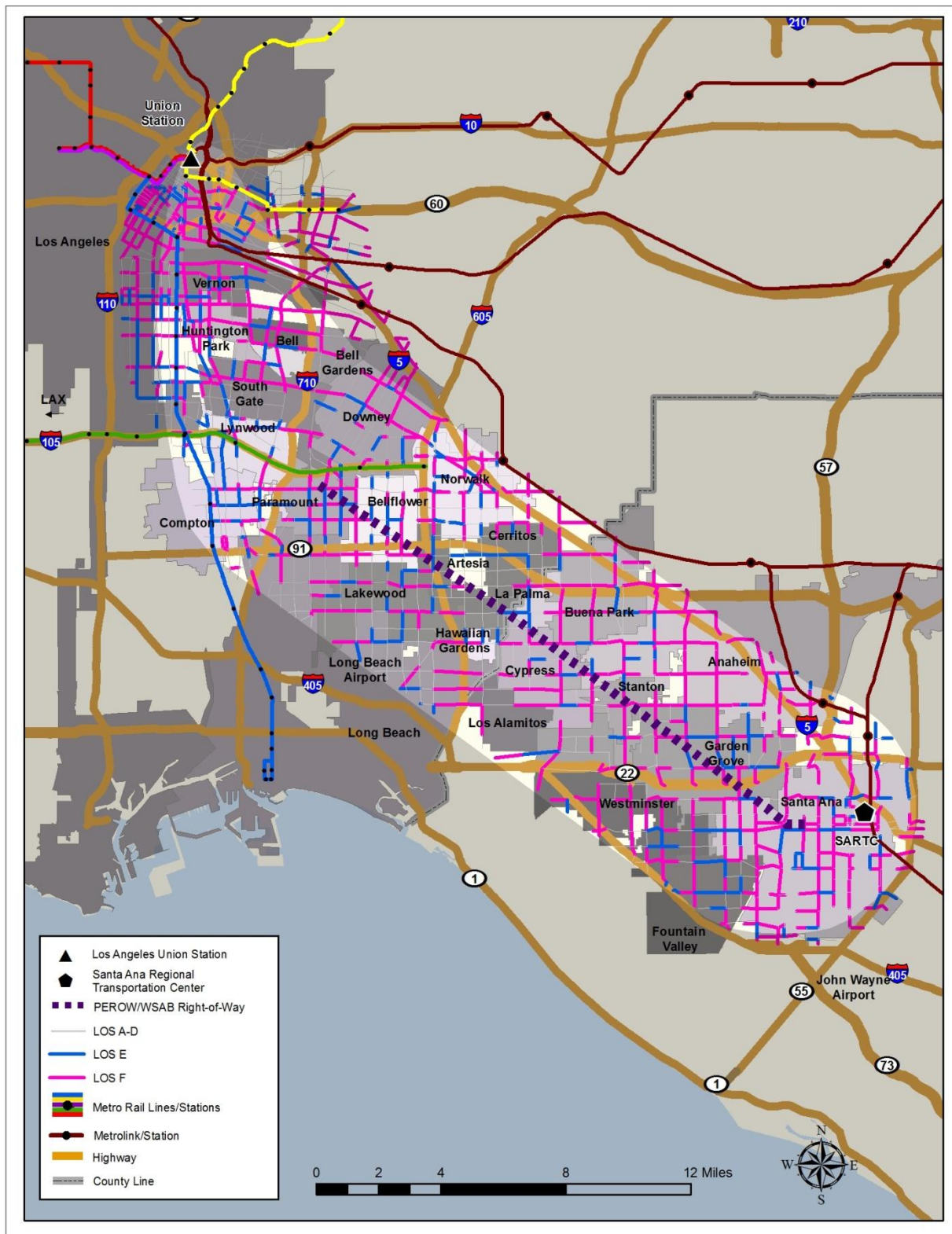


Figure 5.4 – Arterial System: Level of Service (2035)



5.2 Regional and Local Transit System

In the study area, bus transit service is the predominant transit service currently available to corridor residents with minor rail transit service also provided. The regional Metrolink commuter rail system is accessible only at the northernmost and southernmost ends of the study area. While the Metro Green Line is located in the Los Angeles County portion of the study area, its east-west operations do not adequately serve the corridor's primarily north-south travel patterns, or its destinations and activity centers. No transit infrastructure improvements are planned beyond minor bus service increases, which will improve mobility, but only in limited portions of the study area, and will not address the corridor's growing travel needs. With the forecast growth in population, employment, and resulting daily travel, along with the high level of low income and transit-dependent households, and without future transportation system improvements, Corridor Study Area mobility will be negatively impacted by:

- Limited modal choices;
- Constrained bus transit service;
- Lack of cross-county line transit service coordination;
- Poor connections to the regional transit system; and
- Poor local and regional connectivity to corridor destinations and activity centers.

Limited Modal Choices

The ability to move quickly and efficiently within the Corridor Study Area can be expressed in terms of transportation system choice. Currently, corridor travelers have a limited choice of travel options both of which operate on an increasingly congested highway system. Future corridor transportation improvements will need to provide travelers with a more complete set of transportation alternatives. A high-capacity transit system would provide residents with a new travel option.

Constrained Bus Service

The study area's existing bus transit service is constrained in effectiveness and patron convenience by frequent stops, slow travel speeds due to traffic congestion, and poor coordination between service providers. Today, there is a good level of bus transit service coverage with most major arterials served by at least one route. Even with this level of coverage, the study area's bus service has been repeatedly identified by the public and stakeholders as not adequately serving the corridor's current and future transit needs. Existing operational issues frequently make bus use difficult for transit-dependent riders and daunting for non-transit-dependent (choice) riders. The level of service provided – as well as the different service hours and fare structures, lack of schedule coordination, and the inability to transfer easily between providers – is not always commensurate with the needs of transit-dependent residents, nor welcoming to the choice rider. The ability to attract and retain transit riders depends on a variety of factors, including travel time reliability, perception of security and cleanliness, and seamless interface with other transit services.

From an operator's perspective, providing bus service in congested highway conditions has negative impacts on schedule adherence and the coordination of transfer points to allow for seamless connections. Bus service in congested conditions also results in higher operating costs, due to the need for additional buses and drivers to maintain reliable service schedules.

Lack of Transit Service and Coordination across County Lines

The Corridor Study Area covers portions of two counties with multiple bus and circulator services that are not seamlessly planned and operated across county lines to accommodate travel patterns to key destinations located in both counties. Currently, cross-county service is limited to six bus lines: Metro provides one line connecting Downtown Los Angeles to the Anaheim/Disneyland area; OCTA operates two lines connecting Orange County commuters to Downtown Los Angeles, one line serving the Veterans Administration Hospital in the Long Beach area, and another line connecting to the Los Cerritos Center in Cerritos; and Long Beach Transit provides service between Orange County and Long Beach College and other destinations.

The resulting service is often fragmented and does not provide cross-county travelers with smooth connections, resulting in gaps in the study area's transit network. While services cross the county line, each agency's primary focus is within its own county boundaries. This often results in poor connections between counties and underserved "dead" spots along both sides of the county line. In addition, the bus routes that currently serve these cross-county markets are slowed by the same congestion as auto traffic, and do not adequately serve longer-distance travel markets. Introduction of a high-frequency, high-capacity transit service connecting the counties and cities, if supported by a feeder bus network, would help to address many of these problems.

Poor Connections to the Regional Transit System

Today, the regional transportation system is comprised of two services – the six-county Metrolink commuter rail system, and the Los Angeles County urban rail system. Access to Metrolink service is available only at the northernmost and southernmost ends of the 34-mile long study area in downtown Los Angeles and Santa Ana. The only connection to the Los Angeles County rail system exists through the east-west running Metro Green Line. While this LRT line operates in the northern portion of the study area, it does not serve the corridor's primarily north-south travel patterns. The lack of direct, high-capacity transit connections to the regional transit system limits mobility and travel choices, and will become more detrimental to future corridor travel and economic vitality as the study area's population, employment, and travel needs continue to grow. The Corridor Study Area offers a unique opportunity to implement service along a dedicated former PE Railway ROW owned by Metro and OCTA for approximately 60 percent of the proposed project length.

Poor Local and Regional Connectivity to Corridor Destinations and Activity Centers.

The Corridor Study Area contains a diverse set of entertainment, cultural, retail, educational, and recreational destinations attracting and serving corridor residents and regional visitors. Currently, congested travel to the corridor's activity centers makes them less attractive to corridor residents and regional visitors negatively impacting corridor economic vitality. Provision of faster, more direct access to these destinations and activity centers would improve local and regional connectivity to corridor destinations.

Improved local connectivity was identified as a project goal by study area stakeholders and the public, who are frustrated with the increasing traffic congestion on freeways and arterial streets. Currently, arterial congestion makes local trips difficult negatively impacting the corridor's quality of life. Corridor residents and stakeholders saw provision of a transit system improvement as improving local

connections to jobs, schools, goods, and services. They also saw the opportunity to locate stations to support local economic development and revitalization goals.

Many of corridor's destinations are unique and attract visitors from throughout region and beyond, such as Disneyland and Knott's Berry Farm, the performing arts centers in Downtown Los Angeles and Cerritos, and the Anaheim and Los Angeles convention centers. Regional visits to these destinations have become increasingly limited due to congested travel conditions. Provision of a new, less stressful travel option to these destinations would encourage more visits supporting the local economy.

Support local plans for economic development and community revitalization.

Many development and revitalization projects have been completed and others are planned by corridor cities to strengthen their economies, revitalize their community cores, attract and retain employment, better serve residents, and accommodate population growth. A transit investment providing fast, direct connections to and from the rest of the region would not only improve study area mobility and accessibility, but also serve as a catalyst for public and private investment as demonstrated elsewhere in the region.

6.0 PURPOSE AND NEED FOR THE PROJECT

Over the past 15 years, the need for improved travel connections between Los Angeles and Orange counties, possibly through the reuse of all or portions of the PEROW/WSAB ROW, has been established through numerous studies undertaken by OCTA, Metro, and SCAG. The studies concluded that transportation between the two counties, as well as within, to, and from the Corridor Study Area, was constrained, congested, and strongly in need of improvement. There is a demonstrated need for increased transportation system capacity and travel options, as the study area currently has, and is forecasted to continue to capture, a large share of the region's population and employment growth.

6.1 Mobility Problem

The corridor's congested freeway and arterial street system, together with the limited bus and rail service, offer insufficient capacity and travel options to accommodate the forecast increase in daily trips. Development of an effective multi-modal transportation network is essential to meet the future mobility needs of corridor residents and businesses by providing vital intra- and inter-corridor linkages and services. By 2035, the magnitude and nature of the corridor's population, employment, and transit dependency growth are projected to result in continuing transportation challenges:

- **Increasing travel** – By 2035, more than 5.3 million additional daily trips will occur in the Corridor Study Area. The growth in trips within, to, and from the study area will strain the available transportation network.
- **Continuing freeway congestion** – Currently, a majority of the study area's freeways have long segments that operate at or beyond capacity. Even with planned highway system improvements, travelers are forecasted to experience continuing freeway and arterial congestion. In 2035, six of the study area's seven freeways are projected to operate at LOS E or F along 80 to 100 percent of their study area lane miles during the evening peak period, and five of the seven freeways will be similarly constrained during the morning peak.
- **Increasing arterial congestion** – Today, portions of major arterials throughout the corridor Study Area experience high peak traffic volumes resulting in LOS E or F travel conditions during both peak periods. With the forecast increase in population, employment, and daily trips, arterial congestion is projected to increase to 90 to 100 percent of capacity on many routes and arterials currently operating at LOS E or better will drop to LOS F.
- **Limited travel options** – Currently, corridor travelers must choose between the private automobile and bus transit for most trips. Both modes operate on an increasingly congested street and freeway system.
- **Growing transit-dependent population** – With 16 percent of the study area's households lacking access to an automobile, along with a large number of low-income households, a forecast loss of jobs in the northern portion of the study area, and an aging population, a large percentage of the corridor's population will be reliant on the area's transit system in the future.
- **Lack of connections to the regional transit system** – Corridor Study Area residents currently have access to only one Metro urban rail line, and limited access to Metrolink and Amtrak service. The lack of direct, high-capacity transit connections to the regional system limits mobility and travel choices.

- ***Continued poor linkages to and from corridor destinations and activity centers*** – The Corridor Study Area contains many employment, educational, commercial, medical, cultural, and entertainment destinations. Access to these locations is currently constrained and is projected to become more difficult as congestion worsens in the future.

6.2 Project Goals and Objectives

AA study goals and objectives, against which potential transportation improvements would be evaluated, were identified in consultation with the public, stakeholders, and elected officials. The resulting goals and objectives will give the community a perspective on the impacts and benefits of the alternatives. AA study goals and objectives, along with the related evaluation criteria and performance measures, are presented in the *PEROW/WSAB Corridor Evaluation Methodology Report*. They are based on the community goals presented below, the Purpose and Need Statement discussed in this report, along with federal, state, regional, county, and local requirements. Reflecting recent FTA guidance, the project goals and objectives are organized into five major categories:

1. Public and Stakeholder Support

2. Mobility Improvements

- Provide another travel option.
- Connect to the regional transportation system.
- Serve both community and regional trips.
- Increase access to and from corridor destinations and activity centers.
- Provide a fast travel speed.
- Provide related pedestrian and bicycle facilities.

3. Cost

- Provide a cost-effective solution.

4. Land Use/Economic Plans

- Use station location and spacing to support local economic development and revitalization plans and goals.

5. Environmental and Community Impacts

- Result in no or minimal impacts to adjacent communities.

6.3 Purpose and Need/Summary of Transportation Needs

Implementation of a faster, high-capacity transportation system in the Corridor Study Area is vital to alleviate current and future connectivity and mobility challenges affecting residents and businesses by providing essential intra- and inter-corridor linkages to employment, educational, commercial, medical, cultural, and entertainment destinations. The underlying needs supporting for transportation improvements in the Corridor Study Area include:

- **The study area is forecast to continue to capture a large share of regional population and employment.**

Today, the Corridor Study Area is home to more than 4.5 million people, which represents 33 percent of Los Angeles County's population, and 42 percent of Orange County residents. The study area will continue to capture this large share of regional population in 2035, with a forecast 12

percent increase. From an employment perspective, the study area currently has 2.2 million jobs – representing more than 32 percent of Los Angeles County’s employment, and 46 percent of Orange County’s. In 2035, study area employment will increase by four percent with a majority of the projected increase occurring in the Orange County portion.

- **Continued employment loss in the northern portion of the corridor.**

While remaining a major employment center with 1.1 million jobs, or 21 percent of Los Angeles County’s employment, this former manufacturing heartland of Southern California has suffered disproportionately from long term structural changes to the economy with a shift away from manufacturing to service sector jobs. Since 1990, the northern section of the study area has lost approximately half a million jobs, and future projections show a continuation of this trend. The continued loss of jobs will have a significant impact on an area with a large percentage of low-income (45 percent) and transit-dependent (23 percent) households. Providing Northern Connection Area residents with fast, direct transit system access to employment opportunities elsewhere in the region will become of increasing importance.

- **Existing and future high population and employment densities.**

Corridor Study Area population densities are two to five times higher than in Los Angeles and Orange counties as a whole. By 2035, the study area’s population density is forecasted to increase by 13 percent resulting in an average population density of approximately 12,000 residents per square mile. This will be 146 percent higher than the urbanized Los Angeles County average (8,200) and 266 percent higher than the Orange County average (4,500).

Currently, employment density within the PEROW/WSAB Area is 250 percent higher than the Orange County average and three times higher than the Los Angeles County average. In the Northern Connections Area, the employment density is four times the county average and twice the urbanized county average. These trends will continue in 2035, with the average employment density forecasted to be 5,400 jobs per square mile, more than twice the Orange County average (2,500) and 160 percent higher than the urbanized Los Angeles County average (3,400).

- **There is a high level of existing and future travel demand.**

By 2035, total daily travel originating and remaining in the Corridor Study Area will increase by 18 percent or 2.6 million new daily trips. Even with implementation of the planned highway improvements, the corridor’s freeway and arterial system will experience worsening operations. The conceptual evaluation of possible ridership shows a strong transit market when compared to currently operating Metro urban rail lines.

- **The study area has a large transit-dependent population.**

Today, a corridor-wide average of 16 percent of all households is identified as without access to an automobile. This is three times the Orange County average and 20 percent higher than that of Los Angeles County. The number of transit-dependent residents is expected to increase in the future reflecting an aging population, a large number of low-income households, and the forecasted loss of jobs in the Los Angeles County portion of the study area. In the Northern Connections Area, 45 percent of households are identified as low-income today, and with the projected loss of employment in this portion of the study area, may be expected to increase in the future. All of these factors will contribute to a growing reliance on the corridor’s transit system in the future.

- **The current and future corridor highway system operates at capacity and beyond.**
Today, the freeway and arterial system serving the corridor is highly congested resulting in travel delays for much of each day. A majority of the study area's freeways have long segments that operate at or beyond capacity, and many segments of major arterials experience LOS E or F travel conditions during peak periods. Even with planned highway system improvements, increasing daily travel will adversely impact highway capacity, and the level of service on the already congested highway will continue to decline. In 2035, six of the seven freeways will operate at LOS E or F on 80 to 100 percent of the study area's lane miles during the evening peak; and five of the seven will experience similar conditions during the morning peak. Arterial congestion is projected to increase to 90 to 100 percent of capacity on key routes, with many arterials declining to LOS F operating conditions.
- **Corridor residents have limited travel options.**
Corridor residents have two travel options both of which operate on an increasingly congested arterial and freeway system. Bus transit is constrained in effectiveness and patron convenience by frequent stops, traffic congestion, and poor coordination between service providers. Bus operations in congested highway conditions negatively impacts schedule adherence and transfers. All of these operational issues make bus use difficult for the transit-dependent and daunting for choice riders. Without a new travel option, a majority of the corridor's future trips will continue to occur by car.
- **Corridor residents lack direct connections to the regional rail system.**
Currently, the corridor has only one connection to the Metro urban rail system, and two points of access to Metrolink and Amtrak service. This limits mobility and travel choices contributing to the study area's continued dependence on auto travel.
- **There is poor local and regional connectivity to corridor destinations and activity centers.**
Congested local and regional travel to the corridor's diverse set of entertainment, cultural, retail, educational, and recreational destinations and activity centers makes them less attractive to residents and visitors negatively impacting corridor quality of life and economic vitality.

These corridor mobility issues demonstrate the need for a transportation system improvement in the Corridor Study Area to meet the future mobility needs of corridor residents and businesses. As illustrated in Figure 6.1, investment in a high-capacity transit system would connect this densely populated corridor with the rest of the region – providing residents with improved access to regional destinations and employment opportunities, and attracting regional visitors to the corridor's destinations and activity centers. Implementation of a high-capacity transit system would:

- **Provide a new travel option.**
Future corridor transportation improvements will need to reflect a multi-modal strategy, providing travelers with an option to auto or bus travel on the corridor's congested highway system. A high-capacity transit system would provide residents with a new option when making travel decisions, and increase the corridor's transportation system capacity to meet forecasted travel demand.
- **Provide direct connections to the regional transit system**
The current lack of direct, high-capacity transportation connections to the regional transit system limits Corridor Study Area mobility. A high-capacity transit solution could provide direct access to the Metro urban rail, Metrolink, and Amtrak systems, and seamlessly connect with local services.

- **Provide needed job access for residents.**

The Northern Connections portion of study area currently has a significant number of low-income and transit-dependent households. With the projected continuation of the region's economic restructuring, this former manufacturing heart of Southern California will lose more jobs in the future. Provision of a direct connection to the regional transit system will provide residents with vitally needed access to employment opportunities elsewhere in the region.

- **Improve access to corridor activity centers and destinations.**

Currently, local and regional access to the corridor's activity centers and destinations is congested, making them less attractive to corridor residents and regional visitors. Provision of faster, more direct access to these destinations and activity centers would strengthen their economic vitality.

- **Support local plans for economic development and community revitalization.**

Many development and revitalization projects have been completed and others are planned by corridor cities to strengthen their economies, revitalize their community cores, attract and retain employment, better serve residents, and accommodate population growth. A transit investment providing fast, direct connections to the rest of the region would not only improve study area mobility and accessibility, but also serve as a catalyst for public and private investment as demonstrated elsewhere in the region.

Figure 6.1 – Potential Corridor Connection to Regional Transit System (2035)

